



STAY AHEAD OF THE CURVE.

Suckla Farms Injection Well # 1 EPA Falloff Test

EPA Permit No. CO10938-02115

Project Date: **March 16, 2012 to March 26, 2012**

Well: **SUCKLA FARMS INJ WELL (EPA) #1**
API #: 05-123-14291
Operator: K P KAUFFMAN COMPANY, INC
SHL: 2140' FNL, 2020' FEL
Section 10 --T1N -- R67W
Weld County, Colorado

Prepared For: **Wattenberg Disposal, LLC**
1675 Broadway, Suite #2800
Denver, Colorado 80202

Author(s): Clayton Doke, Petroleum Engineer

Copies: Wattenberg Disposal, LLC (2 copies), Peterson Energy Management (1 copy), Electronic File (1 file)

1) Company Name & Address

Wattenberg Disposal, LLC
1675 Broadway, Suite 2800
Denver, Colorado 80202

2) Test Well Name & Location

Suckla Farms Injection Well #1
NW/4 Section 10-T1N-R67W
Weld County, Colorado

3) Facility Contact Person

Kent Gilbert 303-825-4822

Report Prepared by:
Clayton Doke, 970-669-7411
Peterson Energy Management, Inc.
2154 W. Eisenhower Blvd., Loveland CO 80537

4) Openhole Log

See attached Dual Induction Log run 07/02/89
Lyons Sandstone injection zone

5) Well Schematic

See attached well schematic diagram

Wellbore radius: 0.328'
Completed interval depths: Lyons, 9276'-9418'
Type of completion: Cased & cemented, injection under a packer set at 9040' via 2-7/8" fiber-lined tubing

6) Date of Fill Depth

Current fill depth is 9476', recorded in March, 2003.

7) Offset well information

The nearest well completed in the Lyons formation is the Wattenberg SWD #1, NWSW Section 19-2N-66W, operated by Anadarko. This well is approximately 4½ miles to the north-east. No interference between these two wells is assumed to occur for purposes of this analysis.

8) Chronological Listing of Daily Testing Activities

Company has been injecting water into the subject well during daylight hours for five to six days per week for the past year. Injection averaged 471 bbls per day since the last test.

03/16/12	14:47:48	Intermittent daylight injection stopped, well shut in
03/19/12	08:54:02	Tandem gauges installed at 9020' WLM
03/20/12	07:01:42	Injection began at 43.7 BWPH

03/21/12	07:00:42	Injection stopped, 1047.6 BW injected
03/26/12	07:49:02	Gauges off bottom (total SI= 120.8 hrs)

9) Electronic Submission of Raw Data

Attached CD contains a file of raw time-pressure-temperature data (at packer depth) for both gauges.

10) Tabular Summary of Injection Rates

Tabular summary of injection rates for the three months preceding the falloff test is attached, as is a rate vs. time plot for the previous three months. This rate-time data is also included in a .csv file on the attached CD.

11) Offset Well Rate Information

As discussed above, no offset well rate information is considered to be useful in this test analysis.

12) Hard Copy of Time and Pressure Data

A tabular summary of raw time, pressure & temperature data (filtered) is attached.

13) Pressure Gauge Information

Bottom Gauge:

10,000 psi, PPS25 electronic memory strain gauge

SN3684

Installed at: 9020.0' WLM

Pressure accuracy: 0.03% FS (+/-3.0 psi)

Pressure resolution: 0.0003% FS (+/- 0.03 psi).

Last calibration: 11/07/11

Top Gauge:

10,000 psi, PPS25 electronic memory strain gauge

SN4051

Installed at: 9019.0' WLM

Pressure accuracy: 0.03% FS (+/-3.0 psi)

Pressure resolution: 0.0003% FS (+/- 0.03 psi).

Last calibration: 11/07/11

Calibration certificates for both gauges are attached.

Gauges supplied by Lightning Wireline (970-785-2670)

14) General Test Information

Date of test: Injection commenced March 20, 2012, ceased March 21, 2012.

Bottom hole pressure monitored from March 19, 2012 to March 26, 2012.

Rate/Time information plotted from January 1, 2012 to March 31, 2012.

Time synchronization: see attached data files.

Location of shut-in valve: well was shut in at the wellhead

15) Reservoir Parameters

Water viscosity (μ):	0.2313 cp	(correlation)
Porosity (ϕ):	6%	(measured- density log porosity)
Total Compressibility (ct):	9.36e-06	(correlation)
Formation Volume Factor:	1.055 rb/stb	(correlation)

Initial formation reservoir pressure: From the attached semi-log Diagnostic Analysis Radial diagnostic plot, p^* is approximately 3828 psia at perforation midpoint. This is 26 psi below the 3854 psia estimated from the semi-log (radial) Diagnostic Analysis plot on the last pressure falloff test run in March, 2011.

Final injection pressure is approximately 4496 psi, 48 psi above the 24-hour injection pressure on the March, 2011 pressure falloff test.

A summary of historical estimated Initial Formation Reservoir Pressure (p^*) values at 9347' perforation mid-point using a 0.442 psi/ft hydrostatic gradient follows:

July, 1993	4417 psia, unreliable (23 hour shut in, surface gauges, no radial flow)
November, 1997	3590 psia
October, 2001	3760 psia
February, 2003	3830 psia
April, 2004	3859 psia (radial plot, multi-layer synthesis)
April, 2005	3647 psia (radial plot, multi-layer synthesis)
April, 2006	3656 psia (radial plot, multi-layer synthesis)
April, 2007	3816 psia (radial plot, radial flow portion of radial test analysis)
March, 2008	3694 psia (radial plot, single layer)
March, 2009	3912 psia (radial plot, single layer)
March, 2010	3931 psia (radial plot, single layer)
March, 2011	3854 psia (radial plot, single layer)
March, 2012	3828 psia (radial plot, single layer)

Date Reservoir Pressure was last stabilized: Stabilization likely occurred during a workover in March, 2003, 108 months prior to this test. The 88.2 hour shut in period preceding the current test may have been long enough to see stabilization, as pressure was fairly steady at the start of injection.

Justified Interval Thickness: Tracer survey run 7/12/93 & temperature logs run 11/01/01 indicate entire 142' perforated interval is taking fluid. Wireline 1/8/03 & during 3/03 workover shows all perforations open.

16) Waste Plume

Cumulative injection volume into completed interval: 5,547,819 bbls as of March 21, 2012 at 07:00 hrs (post-test volume, includes the 1047.6 bbls injected on the current test). These figures were determined by using injection volumes supplied by the Colorado Oil & Gas Conservation Commission through December, 1997, and injection volumes supplied by the operator from January, 1998, through March, 2012.

There were 170,972 bbls water injected into this well in the year since the last test.

Calculated radial distance to the waste front: We are unable to empirically calculate a distance to

the waste front from this type of test as there is no contrast between historic waste plume viscosity and formation fluid viscosity.

Average historical waste fluid viscosity: To our knowledge, no direct viscosity measurements have been taken. Waste plume viscosity is assumed to be the same as formation fluid viscosity. Essentially all of the waste fluid injected into the Suckla Farms #1 has been oilfield produced water, which does not have a significant contrast to the Lyons formation water.

17) Injection Period

Time: 07:01:42 AM 3/20/2012 to 07:00:42 AM 3/21/2012, 23.98 hours, 1047.6 bbls

Type fluid: oilfield brine/produced water

Pump Type: Water plant injection pump

Rate Meter: Halliburton digital turbine meter. SWD tanks were strapped before & after to confirm volume.

Final injection pressure, surface:	unknown
Final injection pressure at 9347' mid-perf:	4495.5 psia
Final injection temperature at 9020' gauge depth:	151.2° F

18) Falloff Period

Total shut-in time: 07:00:42 AM 3/21/11 to 07:49:02 AM 3/26/11, 120.8 hours

Final shut-in pressure at 9347' mid-perf:	4037.5 psia
Final shut-in temperature at 9020' gauge depth:	242.6°F

Time well went on vacuum: well surface pressure went to 0 psi 88.0 hours before the end of the test.

19) Pressure Gradient

A static gradient was run at the conclusion of this test. No fluid level was noted as the fluid level appeared to be at surface.

20-21) Calculated Test Data and Corresponding Graphs

Please see attached graphs of the current test:

Data Chart	(Rate & Pressure vs Time)
Diagnostic Analysis	(Log-Log Typecurve)
Diagnostic Analysis	(Radial Semi-Log Analysis)
Two Layer Reservoir Model	(Radial and Typecurve)

The Rate vs. Time plot shows bottomhole injection pressure had essentially stabilized after the 24 hour injection period at 4496 psi. Injection pressure was rising at the rate of +/-0.3 psi/hr for the last six hours prior to shut in. No pressure anomalies due to gauge temperature de-stabilization are evident during the test. Data quality appears good. Pressure change during later test times is 0.4 psi per time step. Gauge resolution (+/-0.03 psi) is adequate for the observed pressure change.

The Diagnostic Analysis (Typecurve) shows that a short radial flow period was reached approximately 59.1 hours into the falloff portion of the test. Analysis of this region gives a system permeability of 0.8576 md, with a skin factor of -5.470.

Using the permeability value calculated from the falloff period, we can calculate a radius of investigation from the falloff test as follows for $t = 120.8$ hrs, with other parameters as defined above:

$$r_{inv} = \sqrt{\frac{kt}{948\phi\mu C_r}} = \sqrt{\frac{0.8576 \cdot 120.8}{948 \cdot .06 \cdot 0.2313 \cdot 9.36 \times 10^{-6}}} = 917'$$

Radius of investigation = 917'

The test was also successfully modeled using a Two-Layer Reservoir Model. A good history match is obtained by assuming a 78' layer with a permeability of 2.571 md and skin of -5.082, and a 64' layer with a 1.555 md permeability and -3.067 skin.

Due to the variable rate conditions reported prior to this test, the plots in this report use a superposition time function. EPA Region VI guidelines recommend using a rate history of at least twice the length of the falloff test. Rate information for 81 days preceding the falloff test was used to generate the superposition. This is sixteen times the duration of the falloff test.

Plots were generated using the F.A.S.T. WellTest software package available from Fekete Associates, Inc., Calgary, Alberta, Canada. A .fkt data file is included on the attached CD.

22) Comparison with Petition Demonstration

Condition #5 on Page 12 in Permit # CO10938-02115 stipulates an upper limit of 8,300,000 barrels of injected waste. This corresponds with a waste front of 1,320', assuming piston displacement. The current volume of 5,547,819 barrels injected corresponds to a waste front of 1,108', assuming an injection interval of 142'. While the effective injection interval may be less than 142', the additional fracture porosity postulated in this, and previous reports makes 1,108' a conservative estimate of the radial front of the waste plume. If fractures exist, then the reservoir must contain additional storage in the fracture system, in addition to the 6% matrix porosity. This will have the result of increasing the effective porosity, which decreases the distance to the waste front for any assumed injection volume or effective zone height.

The injection front has progressed 17' since the March 2011 test. There are 212 feet remaining for the front to advance before the 1320' permit limit is reached. This represents approximately 16 years and 1 month at current conditions.

Equation:

$$r_{inf} = \sqrt{\frac{5.615 \cdot V \cdot B_w}{\pi \cdot h \cdot \phi}} = \sqrt{\frac{5.615 \cdot 5,547,819 \cdot 1.055}{142 \cdot 0.06 \cdot \pi}} = 1,108'$$

where $V = 5,547,819$ bbls, $B_w = 1.055$ rb/stb, $h = 142'$, $\phi = 0.06$

It is our opinion that the current test design is adequate to investigate this reservoir, given the constraints of daylight-only injection operations and available water storage. We recommend that subsequent tests follow this same design, which has now been used for seven consecutive annual

tests.

23) Radioactive Tracer Survey

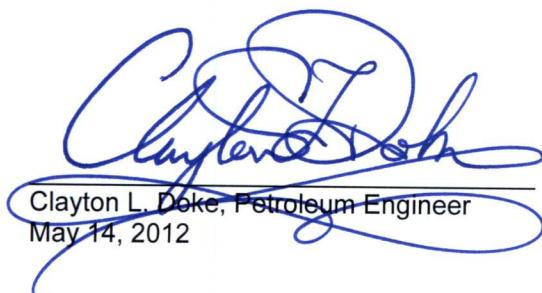
A radioactive tracer was not run during this test. The last radioactive tracer survey run in the Suckla Farms #1 was done in July, 1993.

24) Unusual Permit Approval Conditions

We are not aware of any unusual permit approval conditions.

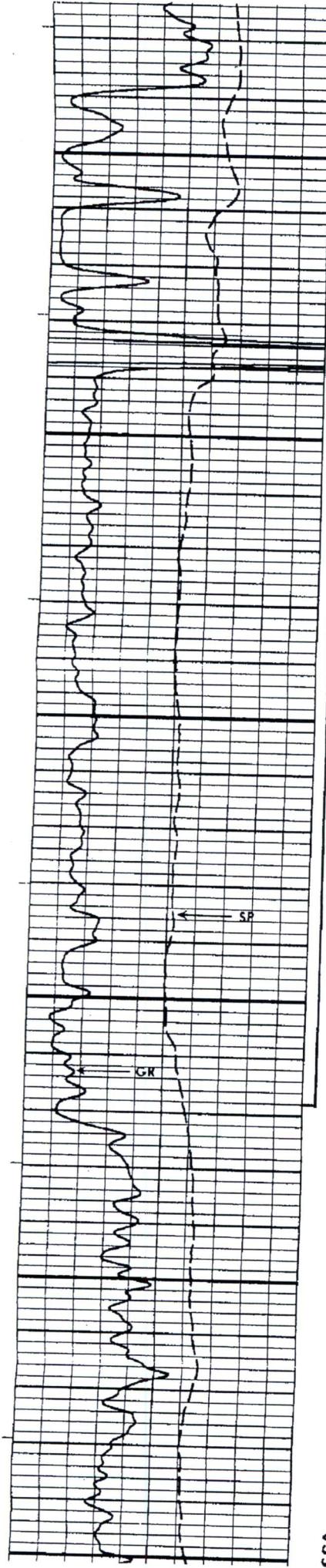
Report prepared for Wattenberg Disposal, LLC. by

PETERSON ENERGY MANAGEMENT, INC

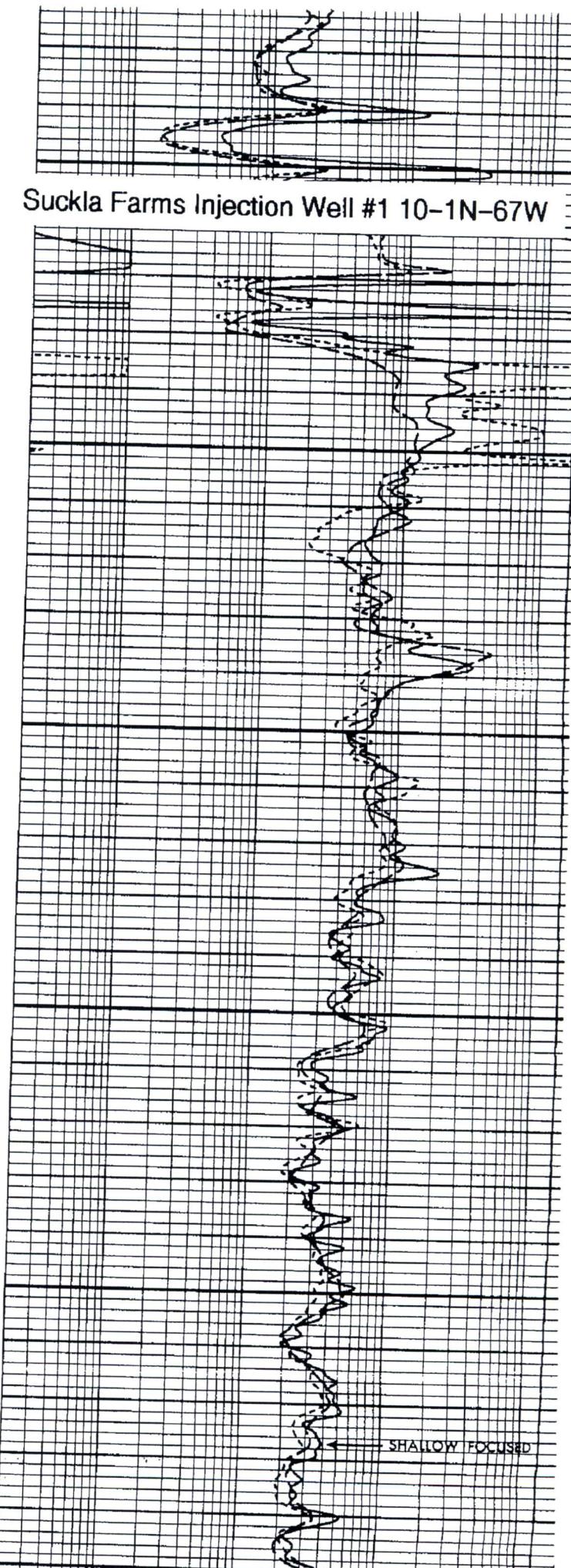


Clayton L. Duke, Petroleum Engineer
May 14, 2012

Reference: EPA Region VI UIC Pressure Falloff Testing Guideline, Third Revision, August 8, 2002

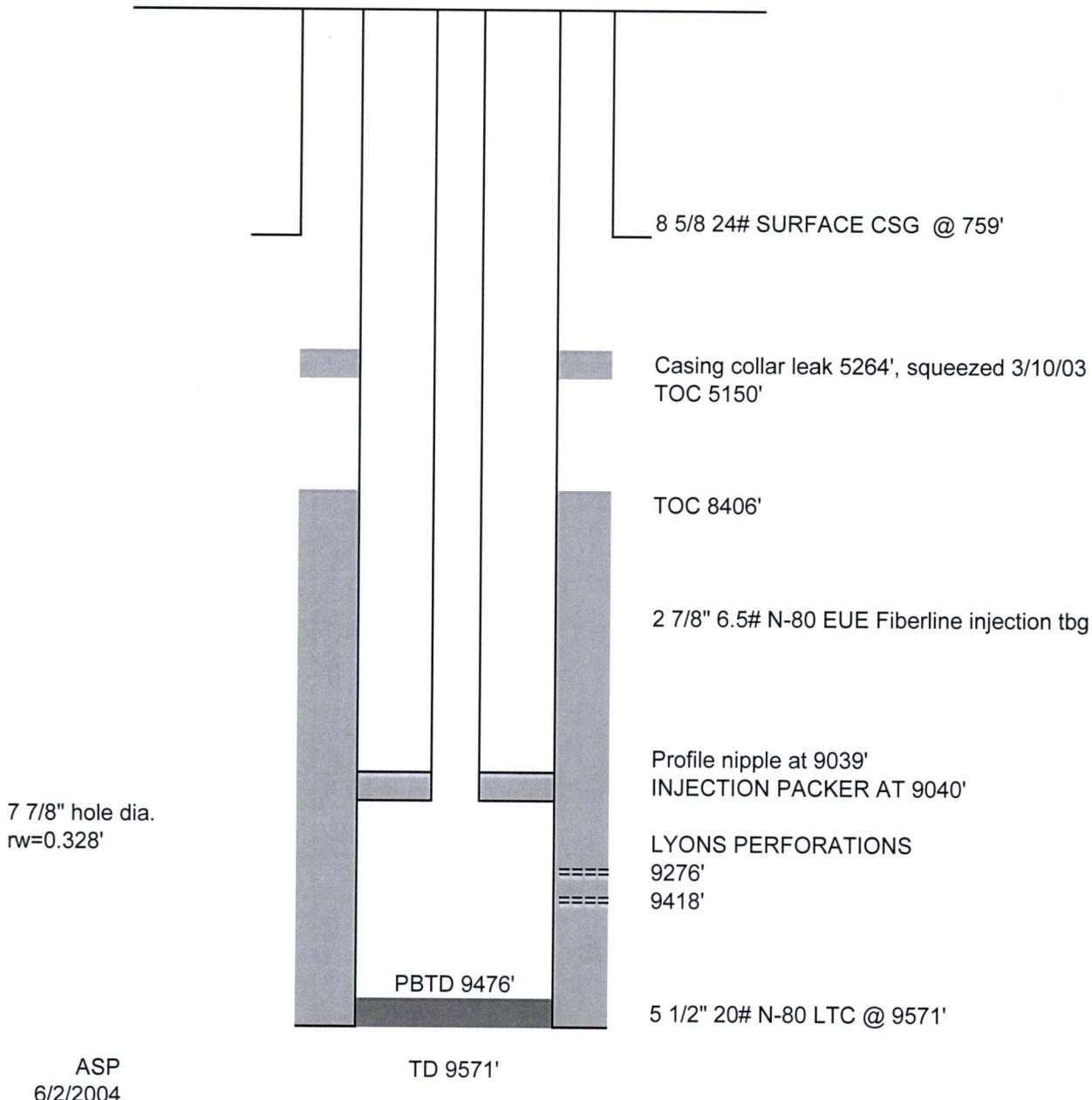


09300
REPEAT SECTION
09400
095



WELLBORE SCHEMATIC

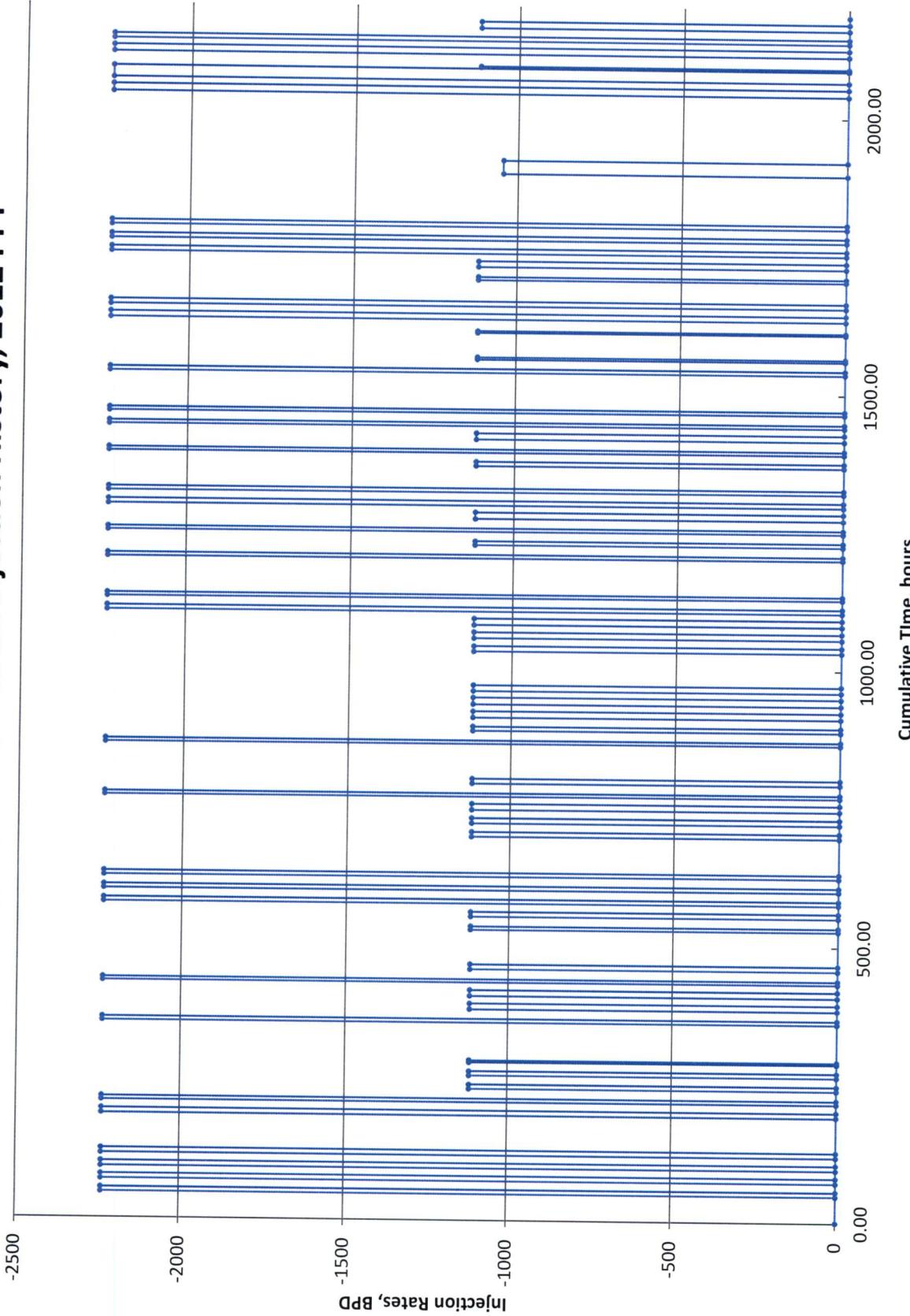
WATTENBERG DISPOSAL
SUCKLA FARMS INJECTION WELL #1
NW/4 SECTION 10-1N-67W
WELD COUNTY, CO
05-123-14291



ASP
6/2/2004

	0	0	23.98			1944.00
0	0	0	0.00	3/22/2012 7:00	3/22/2012 7:00	1944.00
	0		24.03			1968.03
0	0	0	0.00	3/23/2012 7:01	3/23/2012 7:01	1968.03
	0		24.00			1992.03
2	0	0	0.00	3/24/2012 7:01	3/24/2012 7:01	1992.03
	0		24.00			2016.03
2	0	0	0.00	3/25/2012 7:01	3/25/2012 7:01	2016.03
	0		24.00			2040.03
2	-2238.18	1213	13.01	3/26/2012 7:01	3/26/2012 20:02	2053.04
	0		12.13			2065.17
2	-2238.18	1957	20.98	3/27/2012 8:10	3/28/2012 5:09	2086.15
	0		1.88			2088.03
1	-1119.09	96	2.06	3/28/2012 7:01	3/28/2012 9:05	2090.09
	0		21.94			2112.03
2	-2238.18	1102	11.82	3/29/2012 7:01	3/29/2012 18:50	2123.85
	0		12.18			2136.03
2	-2238.18	758	8.13	3/30/2012 7:01	3/30/2012 15:09	2144.16
	0		15.87			2160.03
1	-1119.09	539	11.56	3/31/2012 7:01	3/31/2012 18:35	2171.59

Suckla Farms Well #1 Injection History, 2012 PFT





Pioneer Petrotech Services Inc.

Unit 1, 1431- 40 Ave. NE, Calgary, AB, Canada, T2E 8N6

Tel: (403)282-7669, Fax: (403)282-0509, Email: info@pioneerps.com

Calibration Certificate

Model: PPS25

Pressure Range: 10,000 psi

Serial Number: 3684

Calibration Date: Nov 07 2011

Specifications

Pressure Range:	Minimum:	13 psia	Maximum:	10,000 psia
Temperature Range:	Minimum:	0 °C	Maximum:	177 °C
Pressure Accuracy:		±	0.03 %F.S.	
Temperature Accuracy:		±	0.5 °C	
Housing Material:				SS17-4
Housing OD:				1.25"

Calibration Summary

Calibration Pressure Range:	Minimum:	13.12psia	Maximum:	10,049psia
Calibration Temperature Range:	Minimum:	0.90°C	Maximum:	175 °C
Pressure Accuracy (Maximum Error):		+	2.13psi	
Temperature Accuracy (Maximum Error):		-	0.50°C	

Working Standards

Sun Systems Environmental Chamber, Model: EC12

QuartzDyne Transducer Interface and Display, Model: Series I

QuartzDyne High Pressure Transducer, Model: QS20K-B

Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.

Ana
Pioneer Petrotech Services Inc.

Mar 26 2012
Date



Pioneer Petrotech Services Inc.

Unit 1, 1431- 40 Ave. NE, Calgary, AB, Canada, T2E 8N6

Tel: (403)282-7669, Fax: (403)282-0509, Email: info@pioneerps.com

Calibration Certificate

Model: PPS25

Pressure Range: 10,000 psi

Serial Number: 4051

Calibration Date: Nov 07 2011

Specifications

Pressure Range:	Minimum:	13 psia	Maximum:	10,000 psia
Temperature Range:	Minimum:	0 °C	Maximum:	177 °C
Pressure Accuracy:		±	0.03 %F.S.	
Temperature Accuracy:		±	0.5 °C	
Housing Material:				SS17-4
Housing OD:				1.25"

Calibration Summary

Calibration Pressure Range:	Minimum:	13.12psia	Maximum:	10,002psia
Calibration Temperature Range:	Minimum:	0.90°C	Maximum:	179 °C
Pressure Accuracy (Maximum Error):		+	2.59psi	
Temperature Accuracy (Maximum Error):		+	0.49°C	

Working Standards

Sun Systems Environmental Chamber, Model: EC12

QuartzDyne Transducer Interface and Display, Model: Series I

QuartzDyne High Pressure Transducer, Model: QS20K-B

Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.

Anna

Pioneer Petrotech Services Inc.

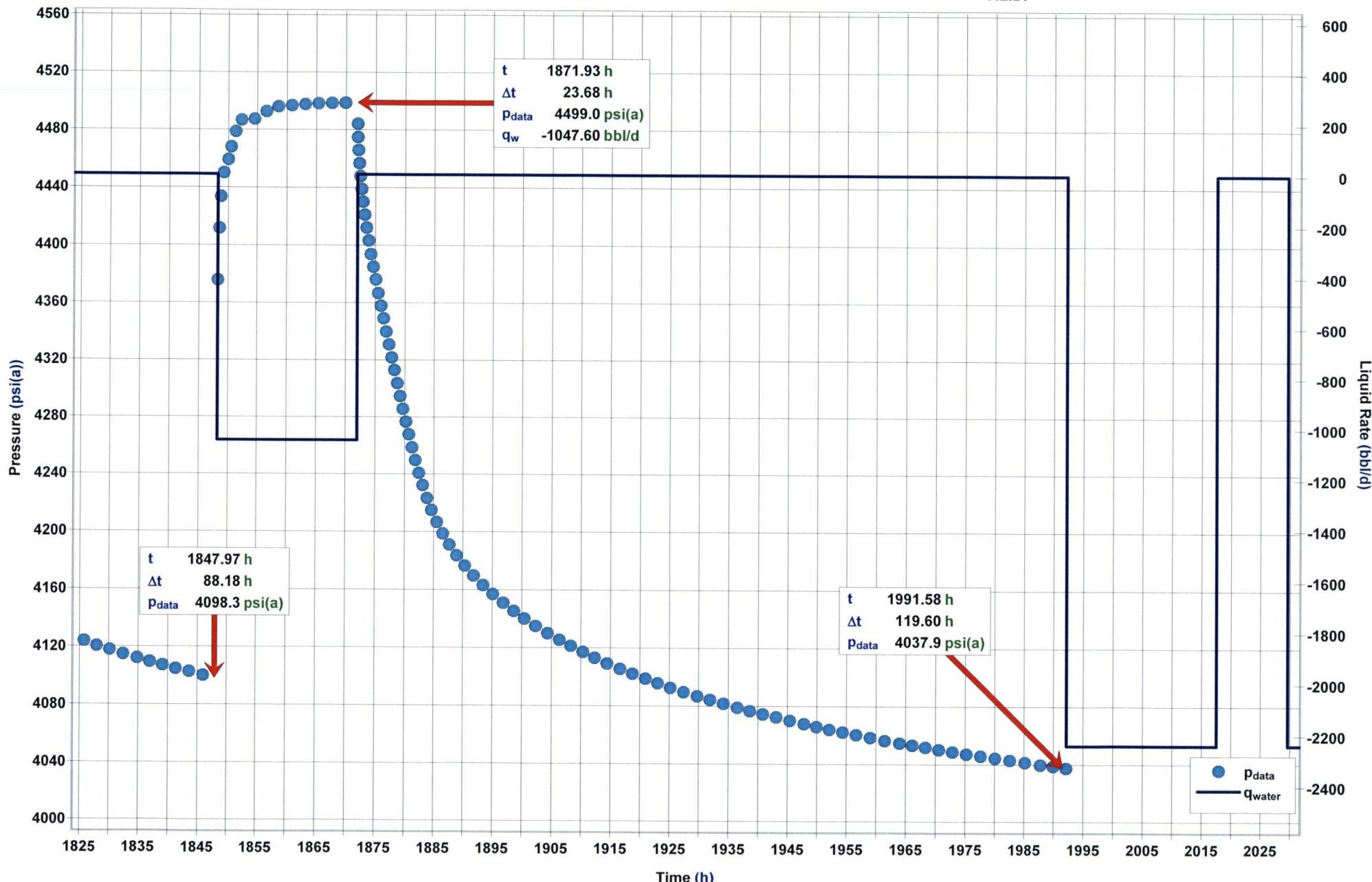
Mar 26 2012

Date

Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

EPA Permit No.: CO10938-02115
API #: 05-123-14291
Analysis: Peterson Energy Management, Inc.
C.L.D.

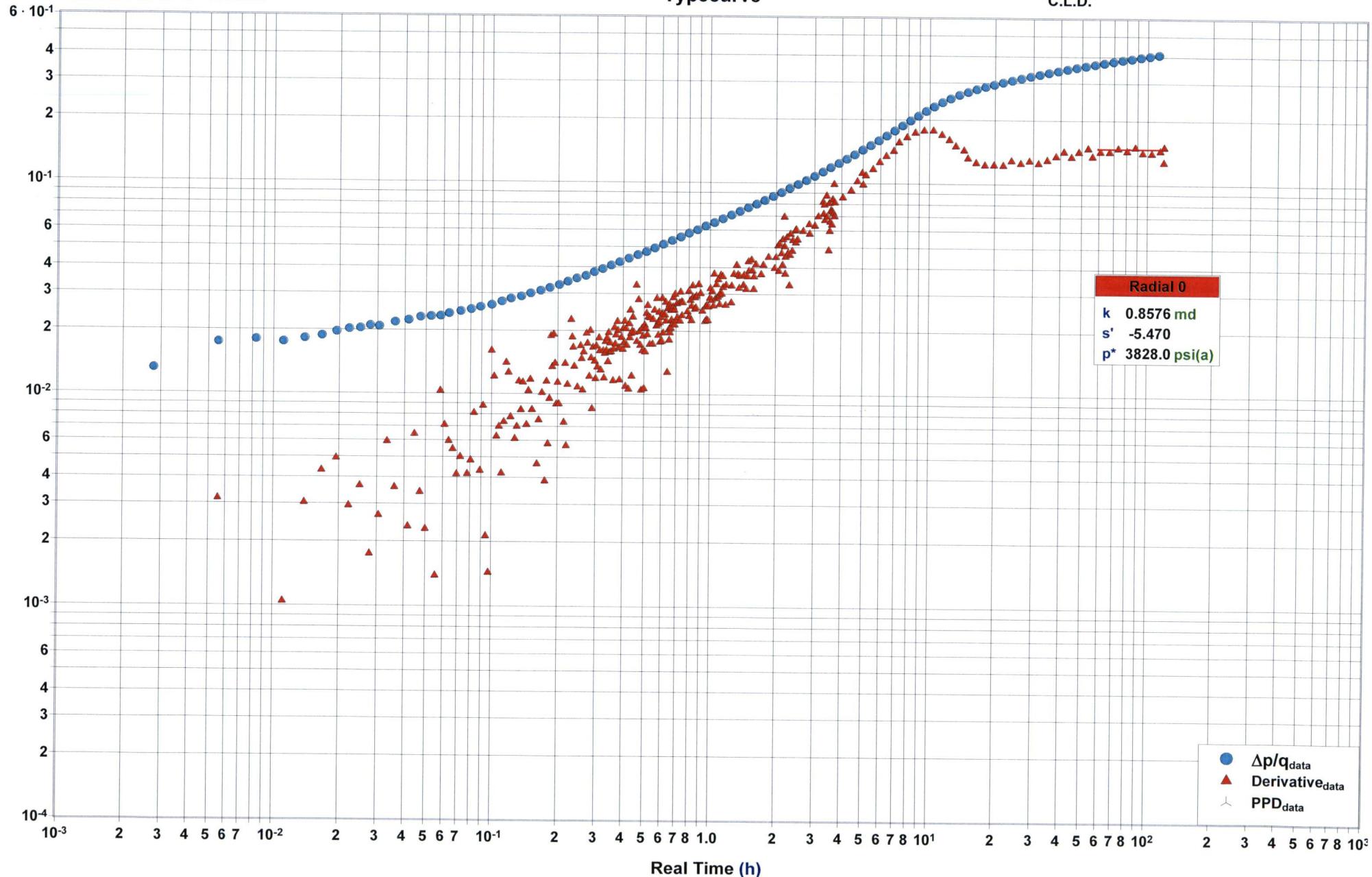
Diagnostic Analysis
Total Test



Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

EPA Permit No.: CO10938-02115
API #: 05-123-14291
Analysis: Peterson Energy Management, Inc.
C.L.D.

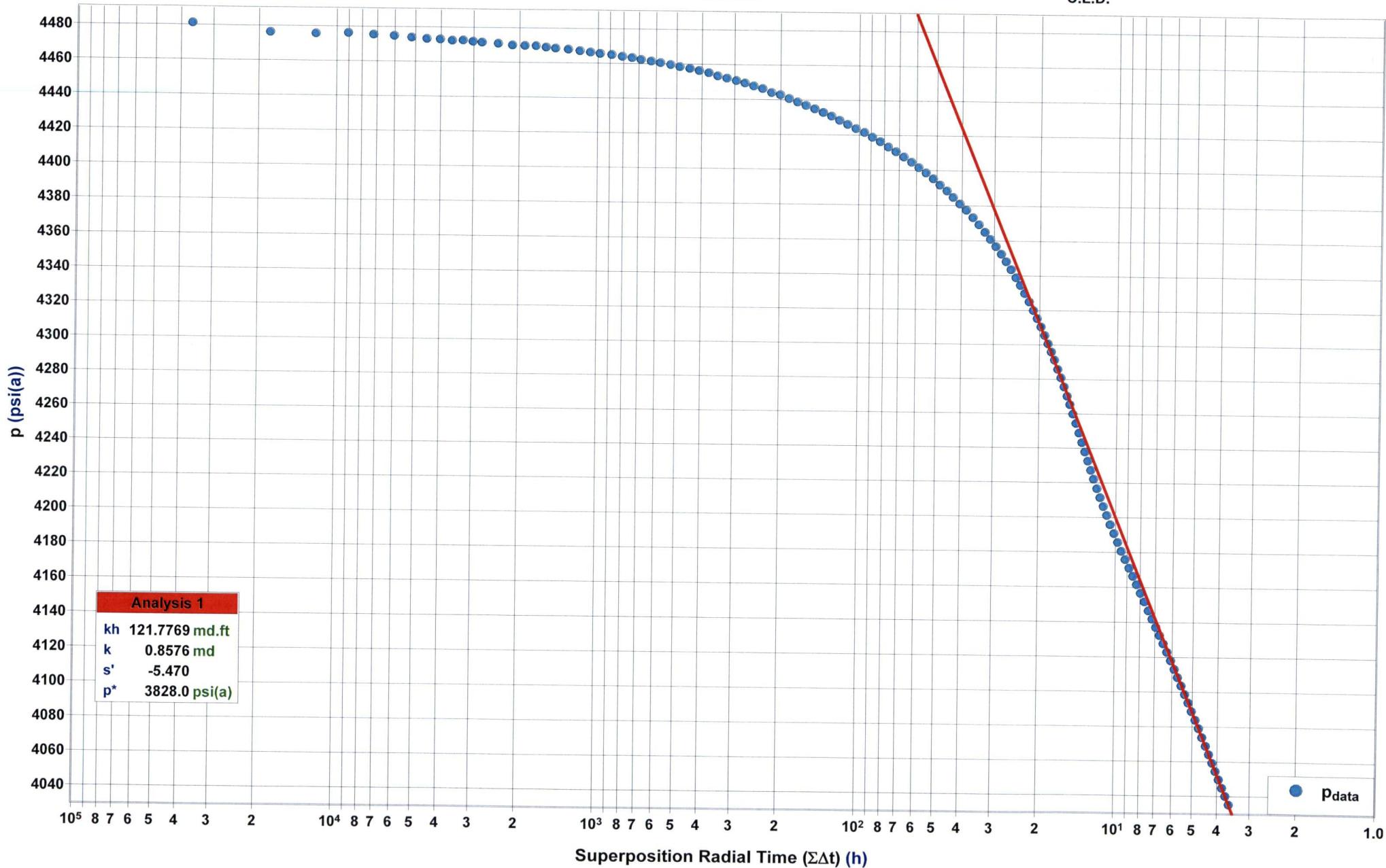
Diagnostic Analysis Typecurve



Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

EPA Permit No.: CO10938-02115
API #: 05-123-14291
Analysis: Peterson Energy Management, Inc.
C.L.D.

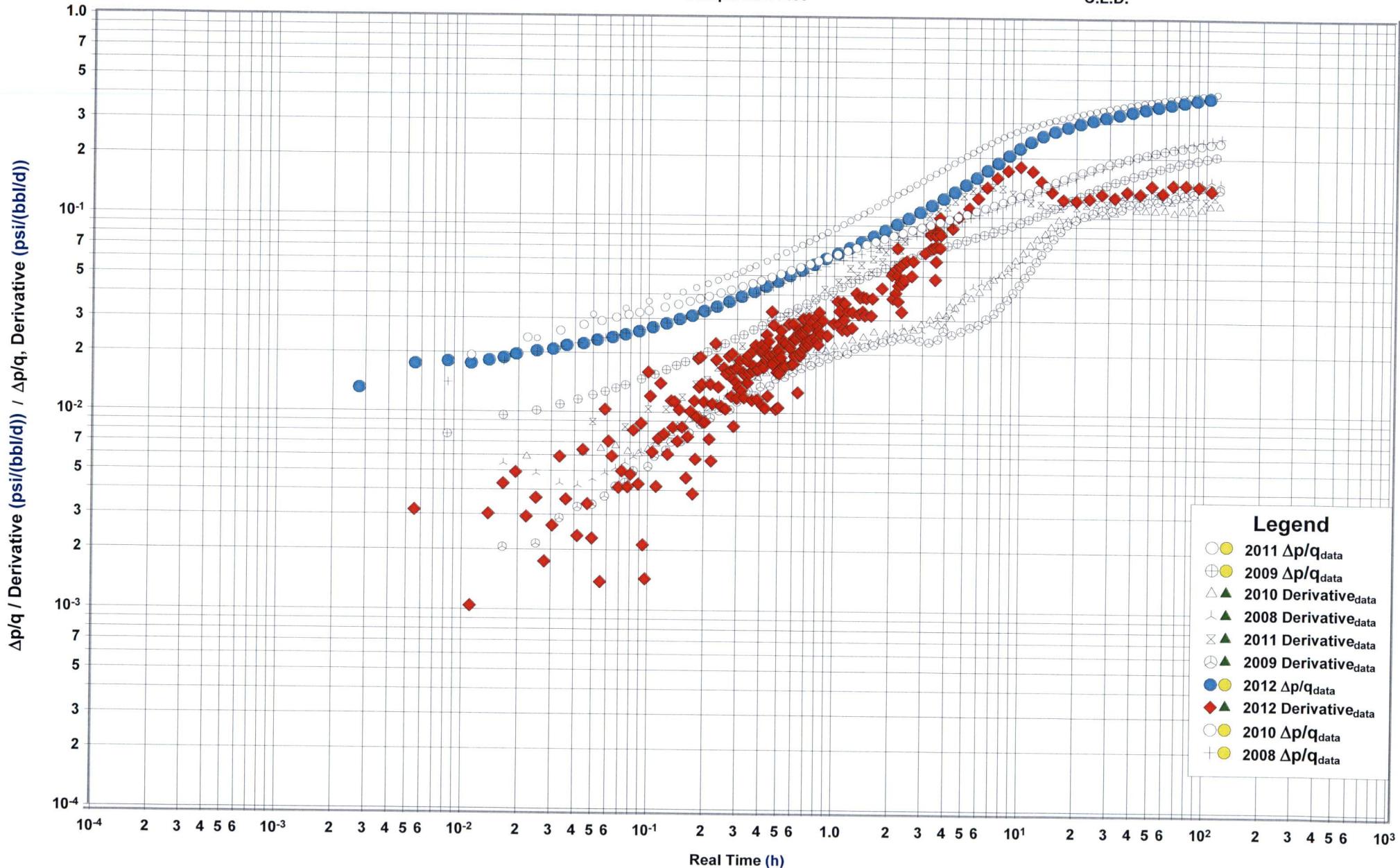
Diagnostic Analysis Radial



Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

Diagnostic Analysis Comparison Plot

EPA Permit No.: CO10938-02115
API#: 05-123-14291
Analysis: Peterson Energy Management, Inc.
C.L.D.



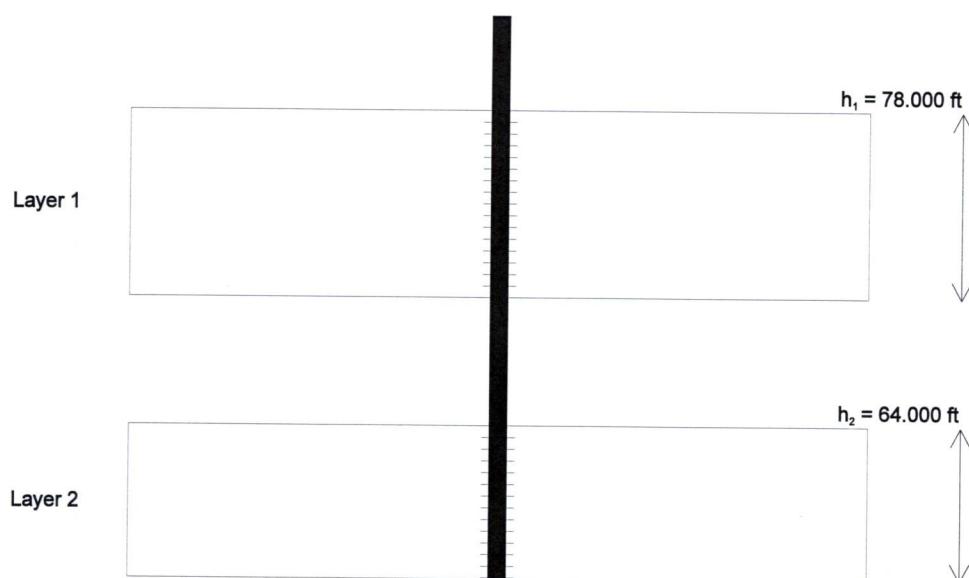
Multilayer Rect. 1

Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

$k_1 = 2.5713 \text{ md}$
 $s_{d1} = -5.082$
 $k_2 = 1.5552 \text{ md}$
 $s_{d2} = -3.067$

Side View

(Not to scale)



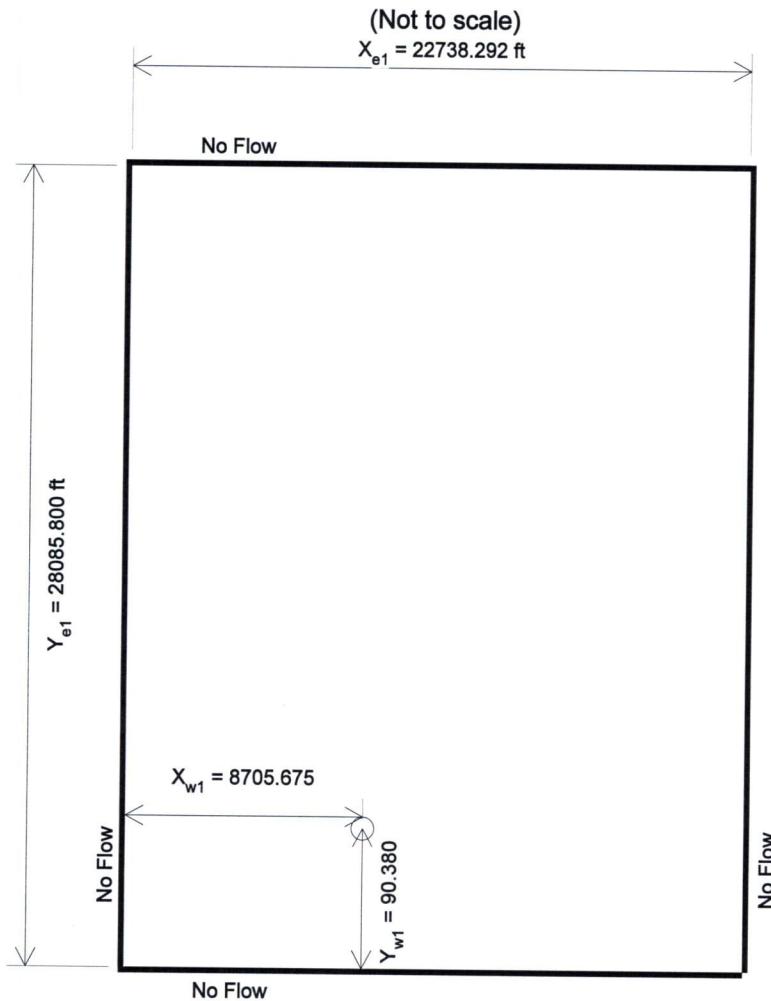
Multilayer Rect. 1

(Layer 1)

Suckla Farms Injection Well #1
SENW 10-1N-67W
Evans Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

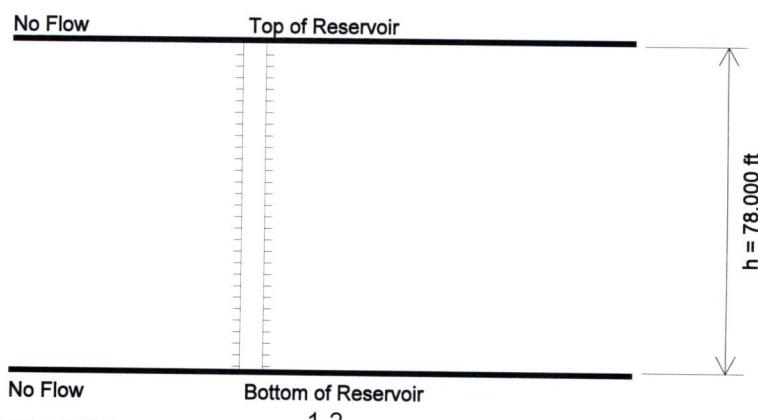
$k_1 = 2.5713$ md
 $s_{d1} = -5.082$
 $k_2 = 1.5552$ md
 $s_{d2} = -3.067$

Plan View



Side View

(Not to scale)



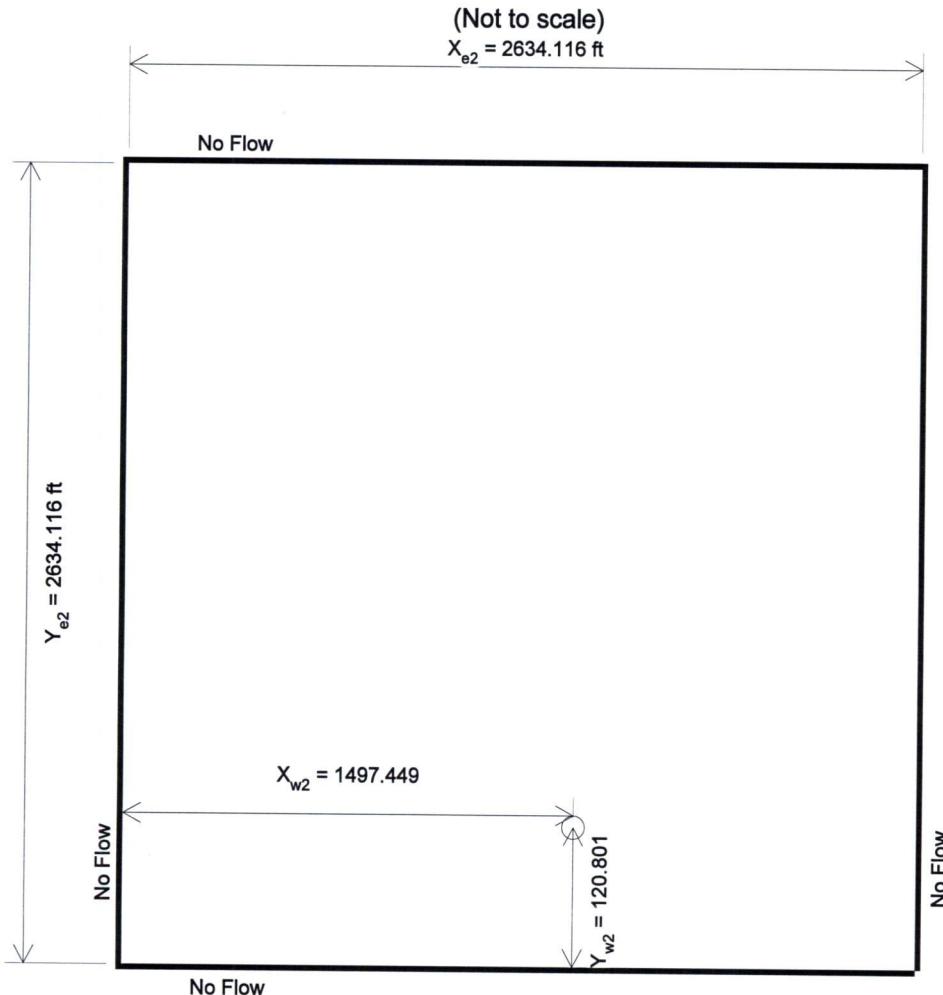
Multilayer Rect. 1

(Layer 2)

Suckla Farms Injection Well #1
ENW 10-1N-67W
Evans Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

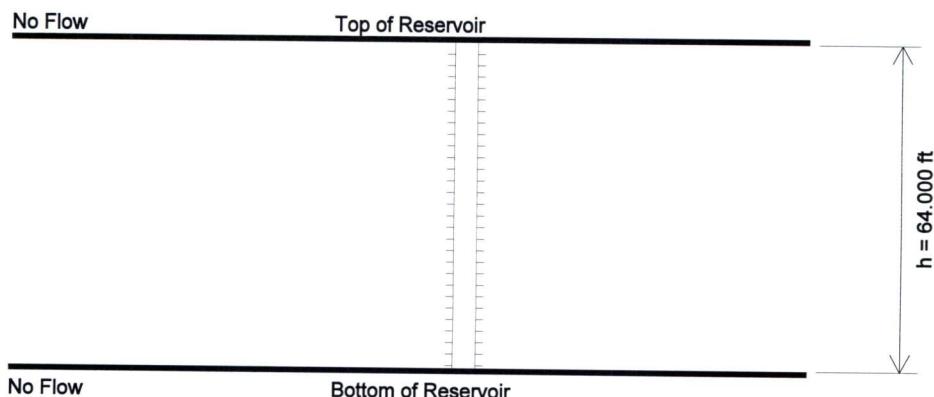
$k_1 = 2.5713$ md
 $s_{d1} = -5.082$
 $k_2 = 1.5552$ md
 $s_{d2} = -3.067$

Plan View



Side View

(Not to scale)



Water Model - Multilayer Rect. 1

Analysis Results

	Layer 1	Layer 2
Total Mobility of Layer 1 ($(k/\mu)_{t1}$)	10.75 md/cP	6.50 md/cP
Effective Permeability (k_1)	2.5713 md	1.5552 md
Net Pay (h_1)	78.000 ft	64.000 ft
Total Skin (s'_1)	-5.082	-3.067
Skin Due to Damage (s_{d1})	-5.082	-3.067
Viscosity (μ_1)	0.2393 cP	0.2393 cP
Total Porosity (ϕ_{t1})	6.00 %	6.00 %
Gas Saturation (S_{g1})	0.00 %	0.00 %
Oil Saturation (S_{o1})	0.00 %	0.00 %
Water Saturation (S_{w1})	100.00 %	100.00 %
Formation Compressibility (c_{t1})	6.0105e-06 1/psi	6.0105e-06 1/psi
Total Compressibility (c_{t1})	9.3360e-06 1/psi	9.3360e-06 1/psi
Length of Reservoir (X_{e1})	22738.292 ft	2634.116 ft
Width of Reservoir (Y_{e1})	28085.800 ft	2634.116 ft
Location of Well in X direction (X_{w1})	8705.675 ft	1497.449 ft
Location of Well in Y direction (Y_{w1})	90.380 ft	120.801 ft

Wellbore Volume (V_w)	219353 bbl
Dim. Apparent Wellbore Storage Constant (C_{aD})	0.014
Dim. Wellbore Storage Constant (C_D)	76167.301
Dim. Wellbore Storage Pressure Parameter (C_{pD})	0.240

Reservoir Parameters

Wellbore Radius (r_w) 0.328 ft

Fluid Properties

Reservoir Temperature (T_{resv})	242.0 °F
Reservoir Pressure (p_{resv})	4037.5 psi(a)
Water Specific Gravity (γ_w)	1.000
Water Viscosity (μ_w)	0.2393 cP
Water Compressibility (c_w)	3.3254e-06 1/psi
Water Formation Volume Factor (B_w)	1.041
Solution Gas Ratio (R_{sw})	0.0 scf/bbl

Production and Pressures

Total Fluid Rate (in situ) ($(q\beta)_t$)	-1165.5 rbbl/d
Final Gas Rate (q_g final)	0.000 MMscfd
Final Water Rate (q_w final)	-1119.1 bbl/d
Total Cumulative Production Water (Cum _{water})	-47.52 Mbbl
Final Flowing Pressure (p_{wfo})	4498.9 psi(a)
Final Measured Pressure (p_{last})	psi(a)

Synthesis Results

Average Error (E_{avg})	0.09 %
Synthetic Initial Pressure (p_i (syn))	3808.8 psi(a)
Extrapolated Model Pressure (p_{model}^*)	3846.8 psi(a)
Pressure Drop Due to Total Skin (Δp_{skin})	0.0 psi(a)
Flow Efficiency (FE)	1.000
Damage Ratio (DR)	1.000

Forecasts

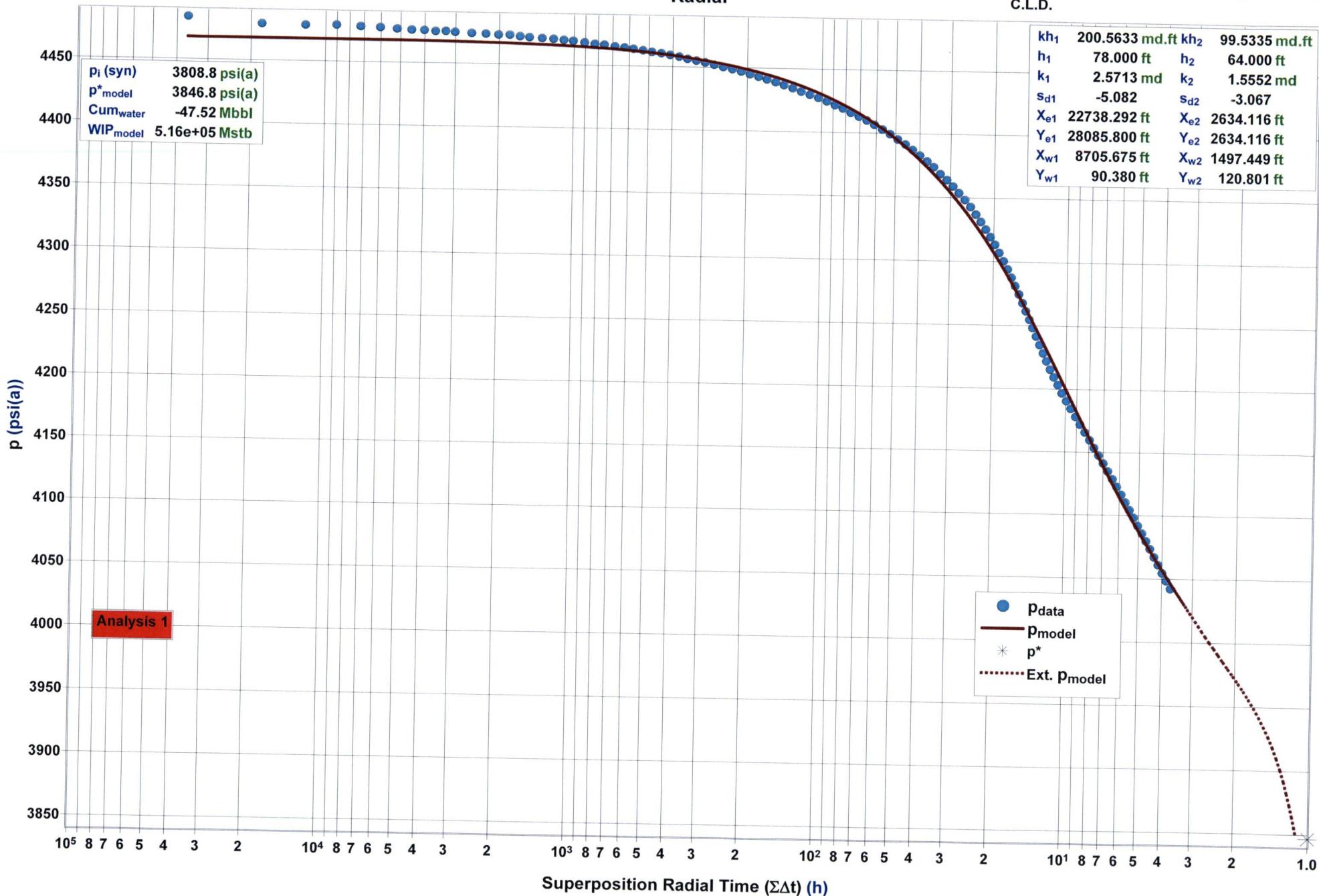
Forecast Flowing Pressure (Report) (p_{flow})	4498.9 psi(a)
Forecast Rate at 3 Months and Current Skin ($q_{@ 3 \text{ Months}}$)	-617.5 bbl/d
Forecast Rate at 6 Months and Current Skin ($q_{@ 6 \text{ Months}}$)	-517.2 bbl/d
Constant Rate Forecast Flow Time (Report) (t_{flow})	12.00 month
Forecast Rate at Specified Time and Current Skin ($q_{@ \text{Current Skin}}$)	-436.9 bbl/d
Stabilized Injectivity Index @ Current Skin (II_{Actual})	0.787 (bbl/d)/psi
Forecast Rate at Specified Time and Skin = 0 ($q_{@ 0 \text{ Skin}}$)	-290.3 bbl/d
Stabilized Injectivity Index @ Skin = 0 (II_{ideal})	0.524 (bbl/d)/psi
Forecast Rate at Specified Time and Skin = -4 ($q_{@ -4 \text{ Skin}}$)	-386.1 bbl/d

Suckla Farms Injection Well #1
 SENV 10-1N-67W
 Lyons Sandstone: 9276'-9418'
 Test Date: 03/20/12 - 03/26/12

Diagnostic Analysis

Radial

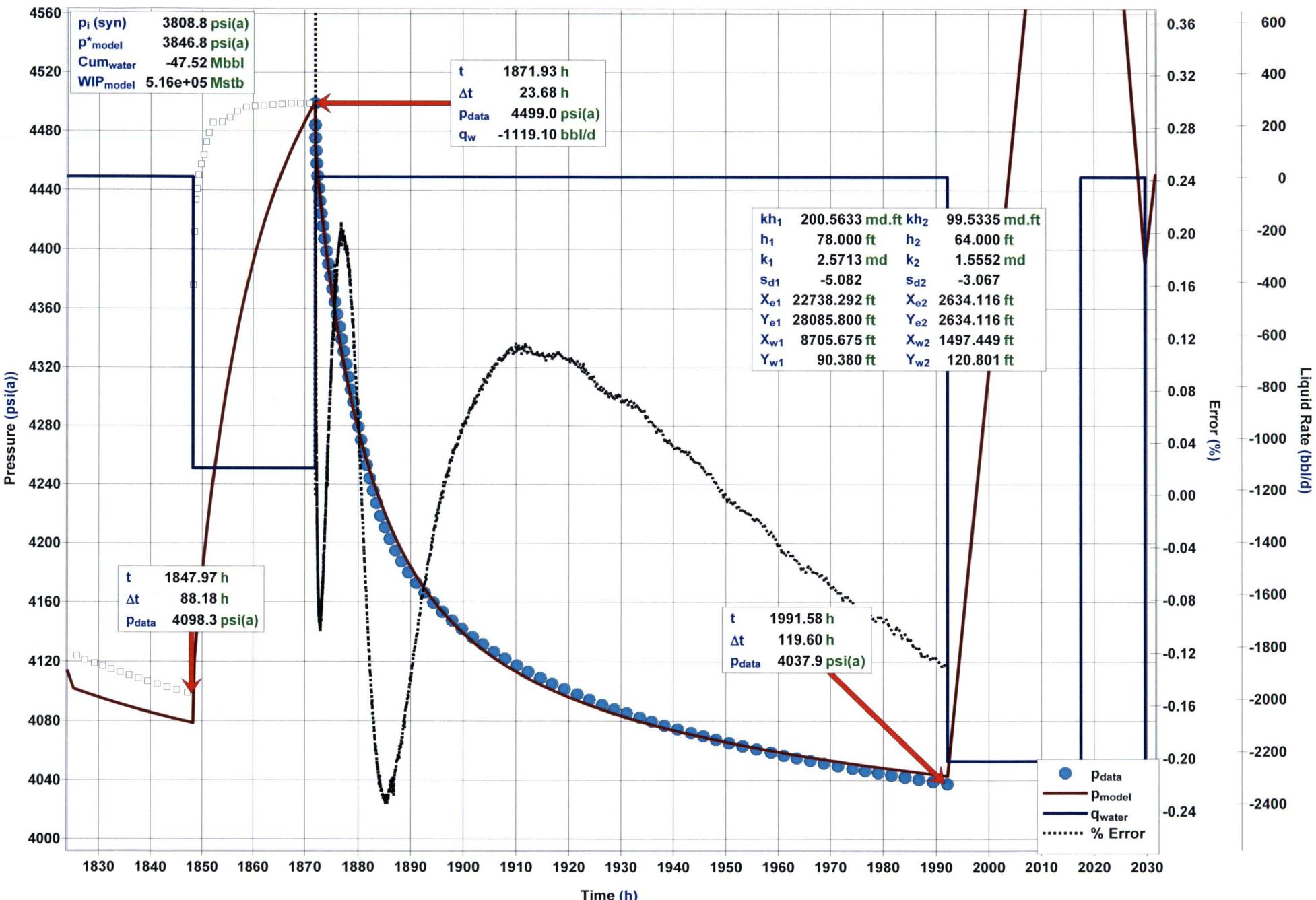
EPA Permit No.: CO10938-02115
 API #: 05-123-14291
 Analysis: Peterson Energy Management, Inc.
 C.L.D.



Suckla Farms Injection Well #1
 SENW 10-1N-67W
 Lyons Sandstone: 9276'-9418'
 Test Date: 03/20/12 - 03/26/12

Diagnostic Analysis Total Test

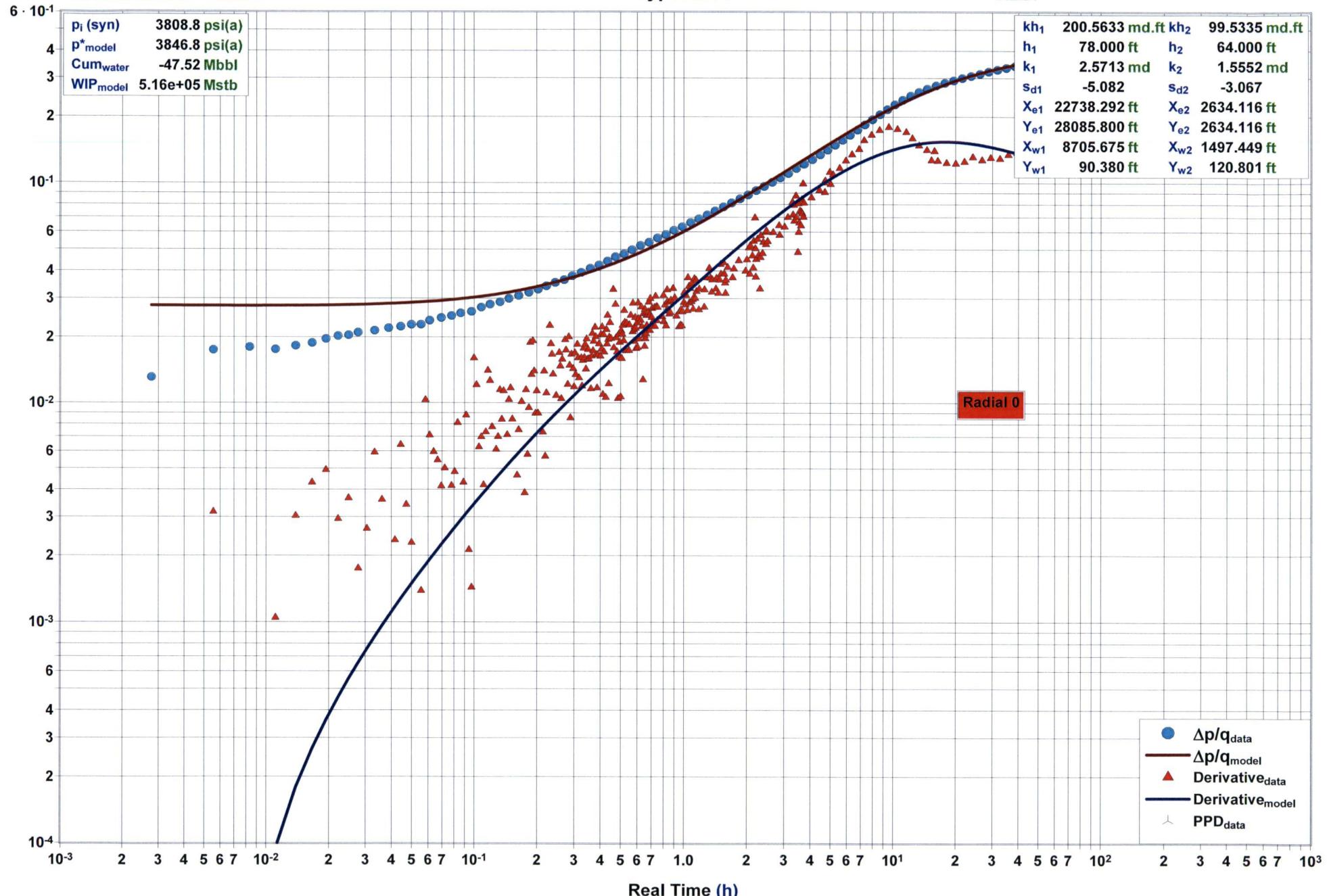
EPA Permit No.: CO10938-02115
 API #: 05-123-14291
 Analysis: Peterson Energy Management, Inc.
 C.L.D.



Suckla Farms Injection Well #1
SENW 10-1N-67W
Lyons Sandstone: 9276'-9418'
Test Date: 03/20/12 - 03/26/12

Diagnostic Analysis Typecurve

EPA Permit No.: CO10938-02115
API #: 05-123-14291
Analysis: Peterson Energy Management, Inc.
C.L.D.



Injection-Static Gradient Top Gauge

Client: **Wattenburg Disposal**

Well Name: **Suckla Farms Injection Well #1**

Location: **SENW Sec 10 T1N R67W**

Field/Pool: **Wattenburg**

Formation Name: **Lyons**

Test/Prod. Interval [ft KB Log]: -

Test Date: **2012/03/19 - 2012/03/26**

Test/job Number:

Service Company: **Lightning Wireline a Schlumberger Company**

SUMMARY

Well Information:

Client Name:	Wattenburg Disposal	Packer:	Yes
Client Address:	c/o Lightning Wireline 103 N. Main Street Platteville, CO 80651	Tubing in Well:	Yes
		Flow Path:	
		Well Fluid Type at Test Date:	
Well Name:	Suckla Farms Injection Well #1	Well Type:	Vertical
Well Location:	SENW Sec 10 T1N R67W		
Pool:	Wattenburg	KB Elevation [ft]:	10.00
Reservoir:		CF Elevation [ft]:	
Well ID:		Ground Elevation [ft]:	
License Number:		Inside Diameter of Production Tubing [in]:	2.1
Drilling Leg:		Inside Diameter of Production Casing [in]:	n/a
Formation Name:	Lyons	Outside Diameter of Production Tubing [in]:	2.9

Test Information:

Test Name:	Injection-Static Gradient Top Gauge		
Test/job Number:		Gauge Run Depth [ft KB (TVD)]:	9019.00000
Test Purpose:	Other	H2S:	No
Test/Prod. Interval Top [ft KB (Log)]:		Test/Prod. Interval Top [ft KB (TVD)]:	
Test/Prod. Interval Base [ft KB (Log)]:		Test/Prod. Interval Base [ft KB (TVD)]:	
Time/Date Well Shut-In:	2012/03/26 14:47:48	Final Test Date/Time:	2012/03/26 07:50:32
Initial Tubing Pressure [psig]:	Vac	Initial Casing Pressure [psig]:	0.00
Final Tubing Pressure [psig]:		Final Casing Pressure [psig]:	0.00
Final Flowing WH Pressure [psig]:		Surface Temperature [degF]:	

Gauge Information:

Gauge Serial Number:	3684	Date Of Last Calibration:	2011/11/07
Maximum Recorder Range [psig]:	9986	Accuracy [% Of Full-Scale]:	0.03
Resolution [% Of Full-Scale]:	0.0003	Date/Time Gauge Off Bottom:	2012/03/01 07:56:00

Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Injection-Static Gradient Top Gauge

EVENTS TABLE

Calendar (yyyy/mm/dd hh:mm:ss)	Elapsed time (hours)	Pressure (psig)	Temperature (degF)	Comment
2012/03/19 08:52:52	0.71444	3961.950	226.775	On Bottom
2012/03/20 07:01:42	22.86167	3945.156	237.100	Start Pumping
2012/03/21 06:59:32	46.82556	4341.430	149.756	Stop Pump and shut in
2012/03/26 07:50:32	167.67556	3894.556	242.735	D = 9019 feet P = 3894.56 psig T = 242.73 degF
2012/03/26 07:59:32	167.82556	3029.389	194.782	D = 7000 feet P = 3029.39 psig T = 194.78 degF
2012/03/26 08:08:02	167.96722	2166.517	148.361	D = 5000 feet P = 2166.52 psig T = 148.36 degF
2012/03/26 08:16:02	168.10056	1293.842	109.566	D = 3000 feet P = 1293.84 psig T = 109.57 degF
2012/03/26 08:22:32	168.20889	855.219	89.857	D = 2000 feet P = 855.22 psig T = 89.86 degF
2012/03/26 08:29:32	168.32556	414.812	74.982	D = 1000 feet P = 414.81 psig T = 74.98 degF
2012/03/26 08:37:32	168.45889	0.836	61.105	D = 0 feet P = 0.84 psig T = 61.11 degF

Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Injection-Static Gradient Top Gauge

GRADIENTS TABLE

Calendar time (yyyy/mm/dd hh:mm:ss)	Elapsed time (hours)	Stop type	Meas. depth (ft)	TV depth (ft)	Pressure (psig)	Temperature (degF)	Pressure gradient (psig/ft)	Temperature gradient (degF/ft)
2012/03/26 07:50:32	167.67556	Static	9019.00	9019.00	3894.556	242.735		
2012/03/26 07:59:32	167.82556	Static	7000.00	7000.00	3029.389	194.782	0.428	0.024
2012/03/26 08:08:02	167.96722	Static	5000.00	5000.00	2166.517	148.361	0.431	0.023
2012/03/26 08:16:02	168.10056	Static	3000.00	3000.00	1293.842	109.566	0.436	0.019
2012/03/26 08:22:32	168.20889	Static	2000.00	2000.00	855.219	89.857	0.439	0.02
2012/03/26 08:29:32	168.32556	Static	1000.00	1000.00	414.812	74.982	0.44	0.015
2012/03/26 08:37:32	168.45889	Static	0.00	0.00	0.836	61.105	0.414	0.014

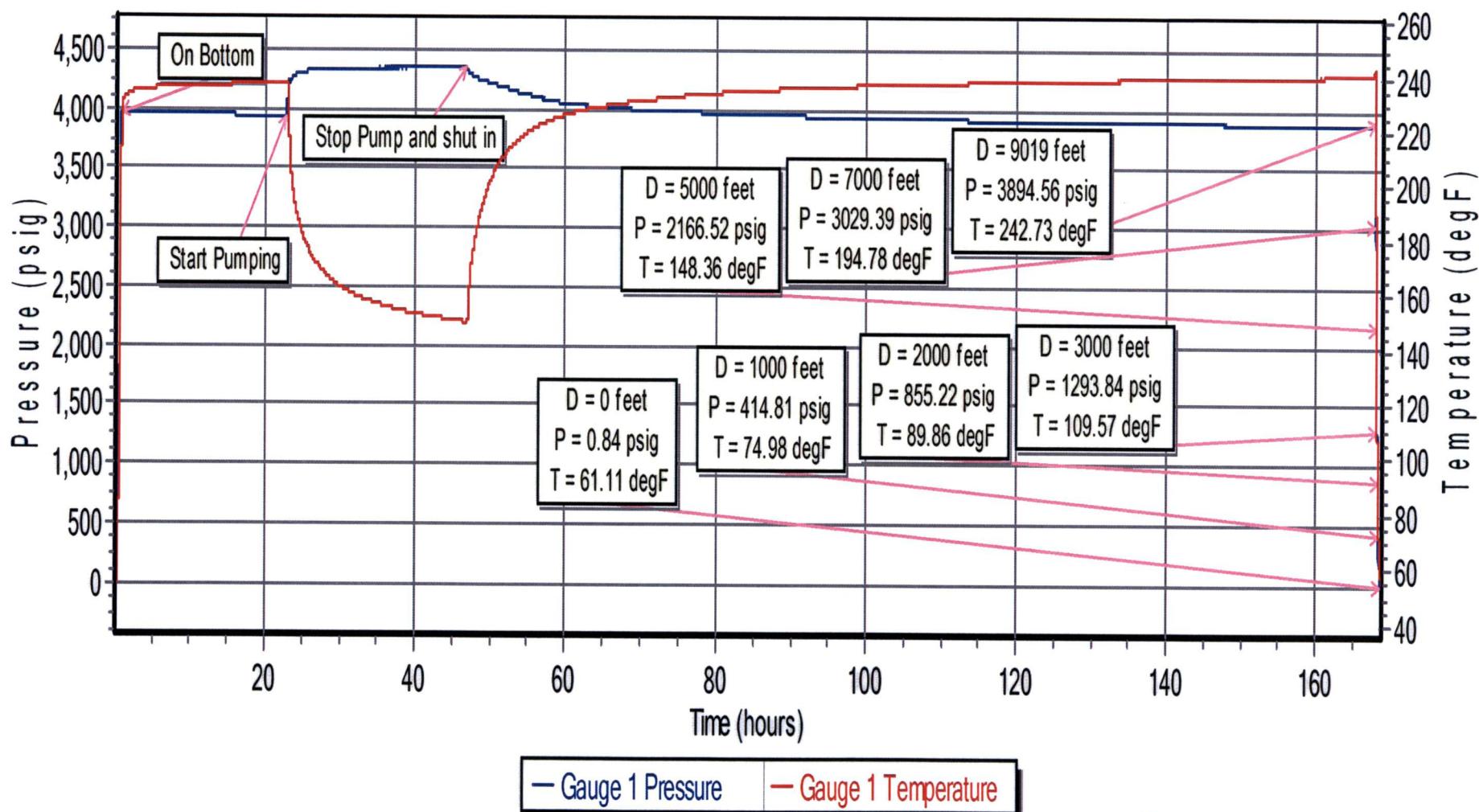
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9019.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Top Gauge

DATA PLOT



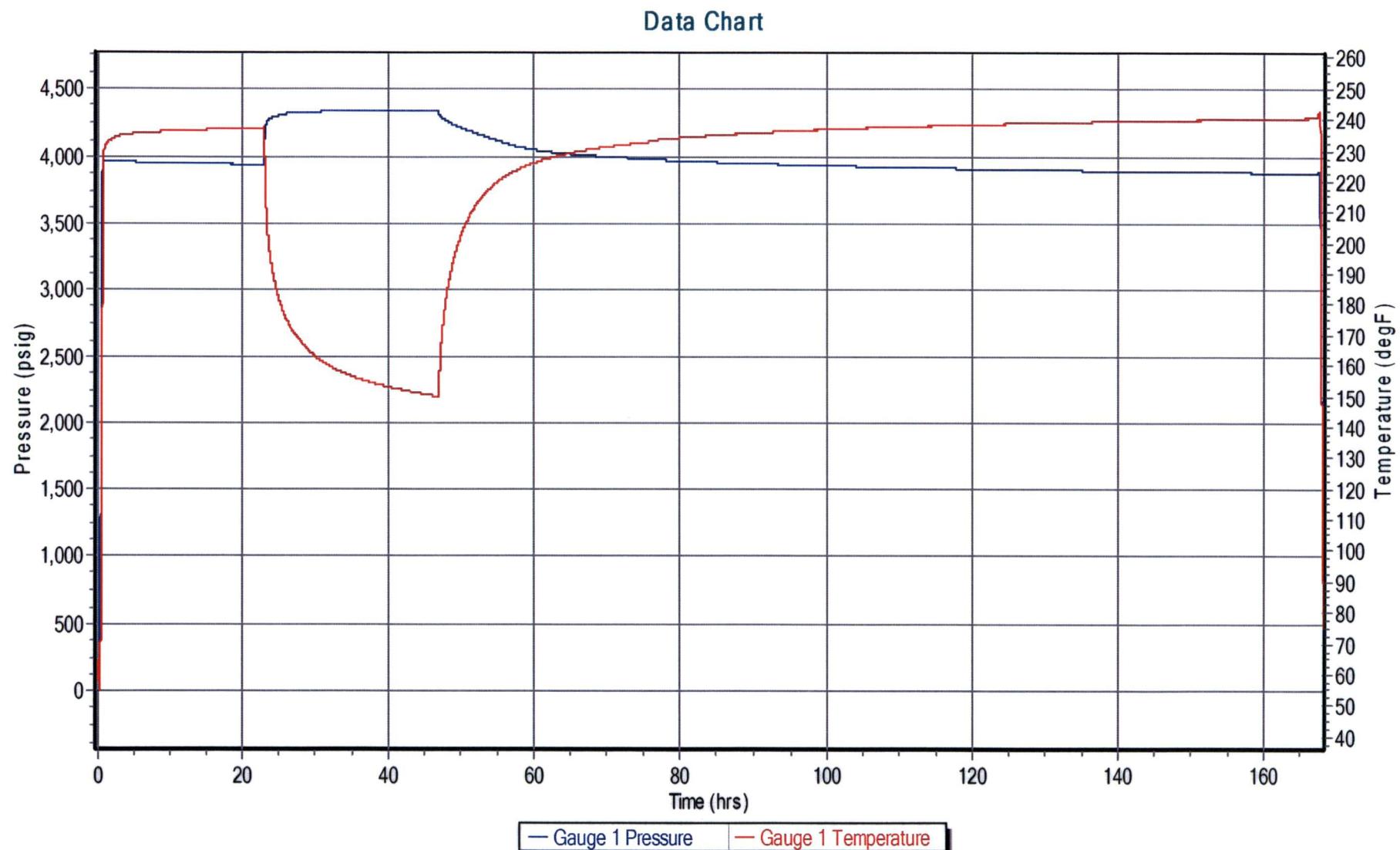
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9019.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Top Gauge

SAVED GRAPH #1



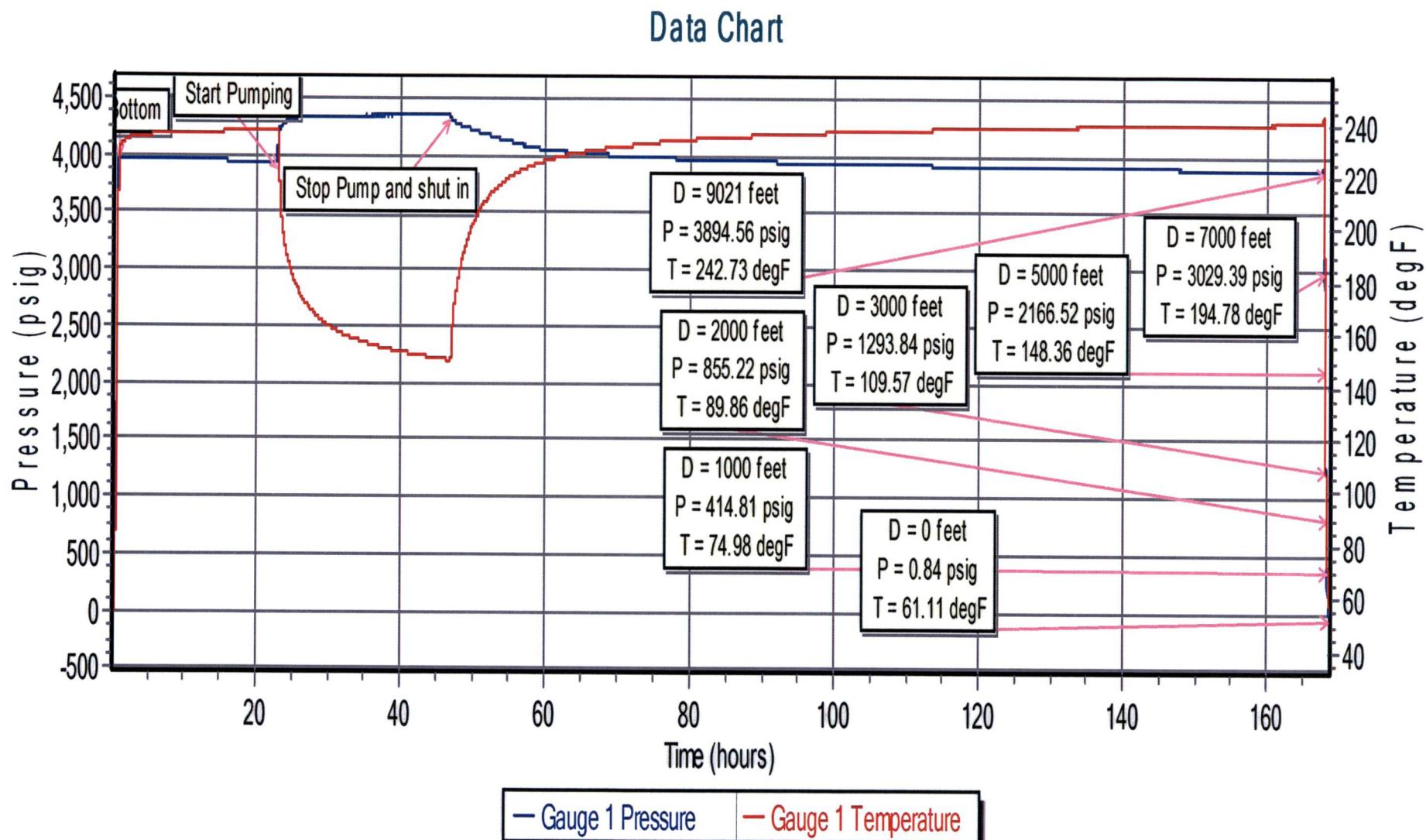
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9019.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Top Gauge

SAVED GRAPH #2



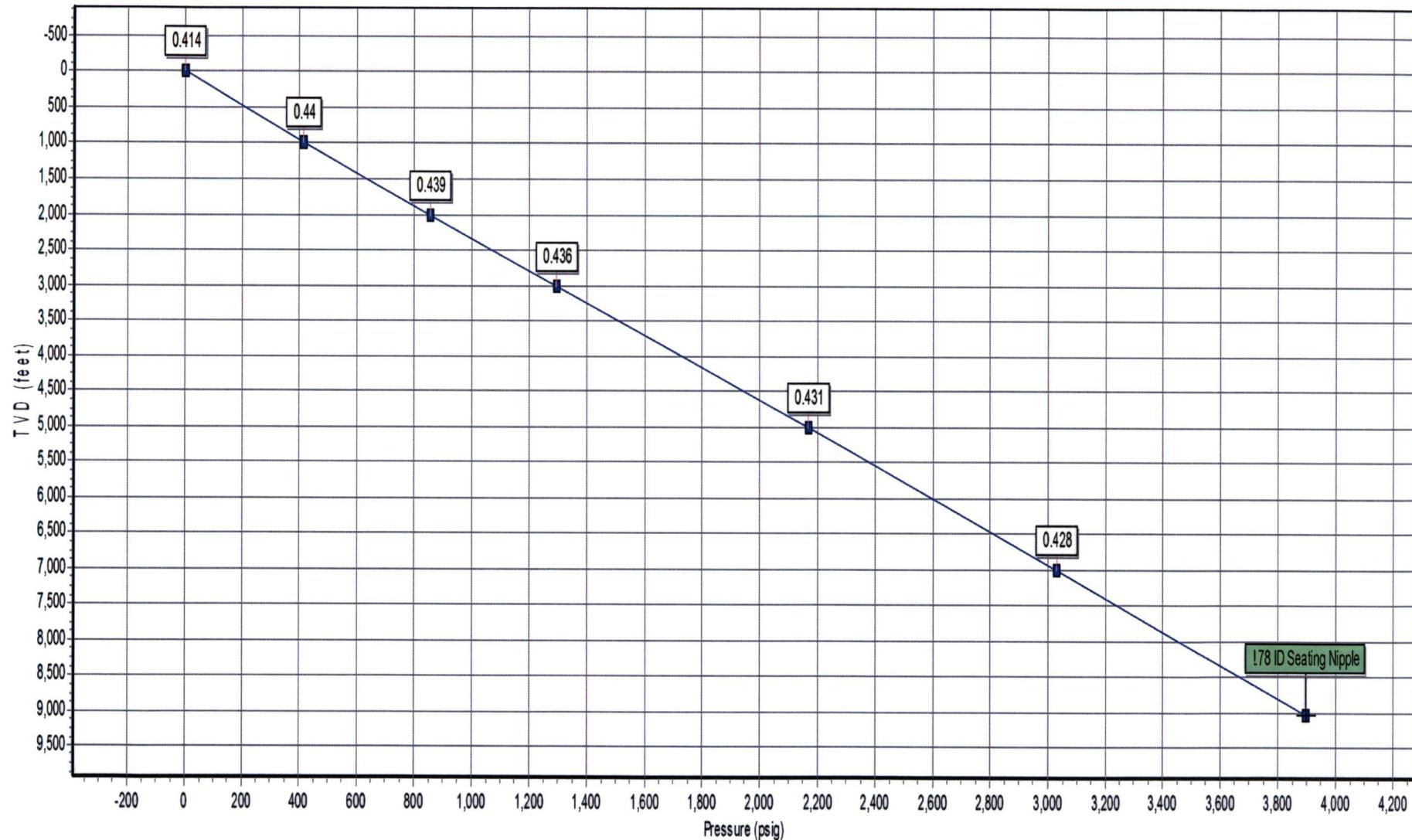
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9019.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Top Gauge

PRESSURE GRADIENT PLOT



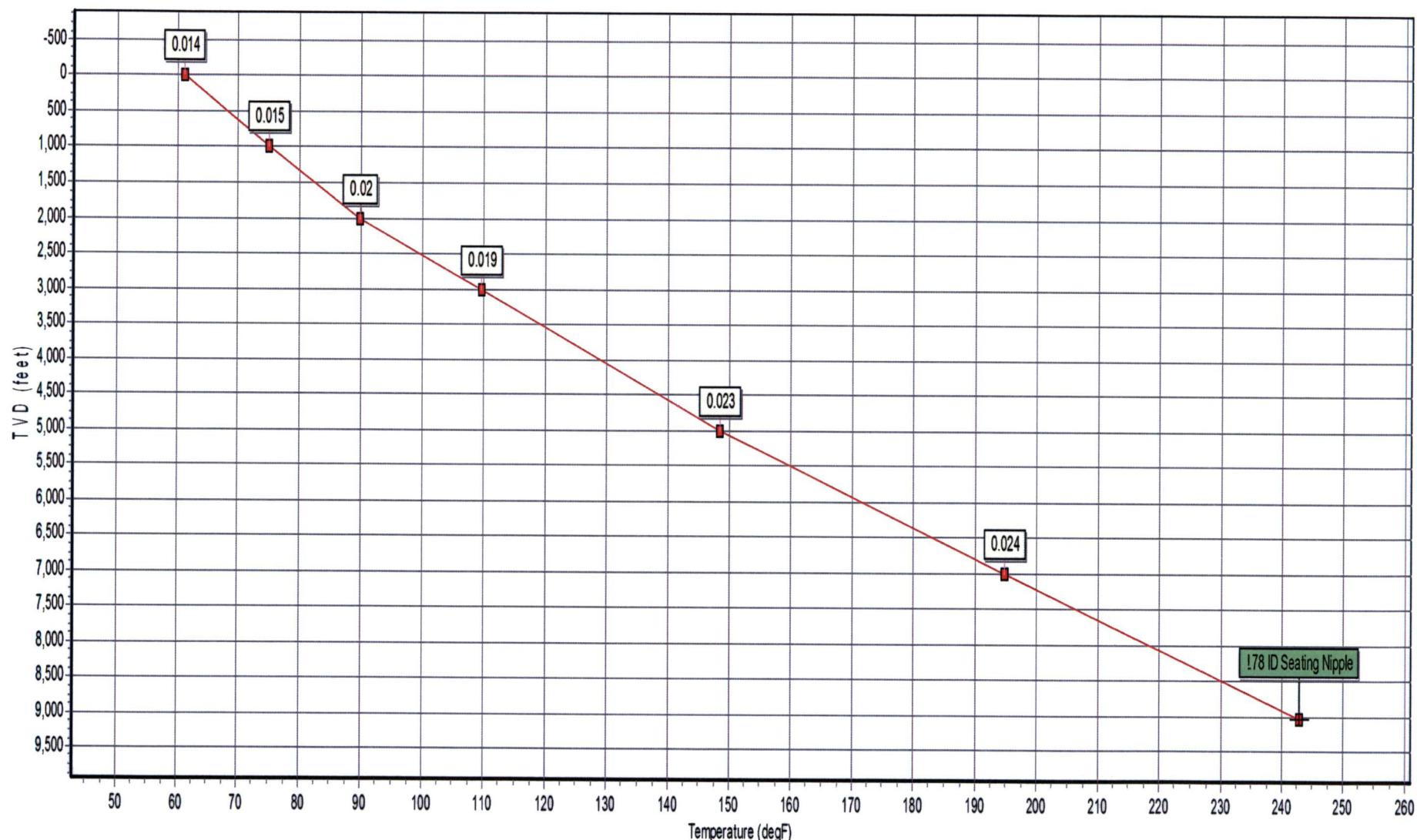
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 3684

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9019.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Top Gauge

TEMPERATURE GRADIENT PLOT



Injection-Static Gradient Bottom Gauge

Client: **Wattenburg Disposal**

Well Name: **Suckla Farms Injection Well #1**

Location: **SENW Sec 10 T1N R67W**

Field/Pool: **Wattenburg**

Formation Name: **Lyons**

Test/Prod. Interval [ft KB Log]: -

Test Date: **2012/03/19 - 2012/03/26**

Test/job Number:

Service Company: **Lightning Wireline a Schlumberger Company**

SUMMARY

Well Information:

Client Name:	Wattenburg Disposal	Packer:	Yes
Client Address:	c/o Lightning Wireline 103 N. Main Street Platteville, CO 80651	Tubing in Well:	Yes
		Flow Path:	
		Well Fluid Type at Test Date:	
Well Name:	Suckla Farms Injection Well #1	Well Type:	Vertical
Well Location:	SENW Sec 10 T1N R67W		
Pool:	Wattenburg	KB Elevation [ft]:	10.00
Reservoir:		CF Elevation [ft]:	
Well ID:		Ground Elevation [ft]:	
License Number:		Inside Diameter of Production Tubing [in]:	2.1
Drilling Leg:		Inside Diameter of Production Casing [in]:	n/a
Formation Name:	Lyons	Outside Diameter of Production Tubing [in]:	2.9

Test Information:

Test Name:	Injection-Static Gradient Bottom Gauge		
Test/job Number:		Gauge Run Depth [ft KB (TVD)]:	9020.00000
Test Purpose:	Other	H2S:	No
Test/Prod. Interval Top [ft KB (Log)]:		Test/Prod. Interval Top [ft KB (TVD)]:	
Test/Prod. Interval Base [ft KB (Log)]:		Test/Prod. Interval Base [ft KB (TVD)]:	
Time/Date Well Shut-In:	2012/03/16 14:47:48	Final Test Date/Time:	2012/03/26 07:50:32
Initial Tubing Pressure [psig]:	Vac	Initial Casing Pressure [psig]:	0.00
Final Tubing Pressure [psig]:	.	Final Casing Pressure [psig]:	0.00
Final Flowing WH Pressure [psig]:		Surface Temperature [degF]:	

Gauge Information:

Gauge Serial Number:	4051	Date Of Last Calibration:	2011/11/07
Maximum Recorder Range [psig]:	9986	Accuracy [% Of Full-Scale]:	0.03
Resolution [% Of Full-Scale]:	0.0003	Date/Time Gauge Off Bottom:	2012/03/01 07:56:00
Date/Time Gauge On Bottom:	2012/03/19 08:54:02		

Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Injection-Static Gradient Bottom Gauge

EVENTS TABLE

Calendar (yyyy/mm/dd hh:mm:ss)	Elapsed time (hours)	Pressure (psig)	Temperature (degF)	Comment
2012/03/19 08:54:02	0.73389	3962.424	228.347	On Bottom
2012/03/20 07:01:42	22.86167	3939.220	239.153	Start Pumping
2012/03/21 07:00:42	46.84500	4319.818	151.316	Stop Pumping
2012/03/26 07:49:02	167.65056	3896.147	245.101	D = 9020 feet P = 3896.15 psig T = 245.1 degF
2012/03/26 08:00:32	167.84222	3029.547	195.432	D = 7000 feet P = 3029.55 psig T = 195.43 degF
2012/03/26 08:08:02	167.96722	2168.082	150.883	D = 5000 feet P = 2168.08 psig T = 150.88 degF
2012/03/26 08:17:02	168.11722	1293.556	110.533	D = 3000 feet P = 1293.56 psig T = 110.53 degF
2012/03/26 08:24:32	168.24222	854.583	89.285	D = 2000 feet P = 854.58 psig T = 89.29 degF
2012/03/26 08:31:32	168.35889	414.374	74.566	D = 1000 feet P = 414.37 psig T = 74.57 degF
2012/03/26 08:37:02	168.45056	1.769	62.454	D = 0 feet P = 1.77 psig T = 62.45 degF

Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Injection-Static Gradient Bottom Gauge

GRADIENTS TABLE

Calendar time (yyyy/mm/dd hh:mm:ss)	Elapsed time (hours)	Stop type	Meas. depth (ft)	TV depth (ft)	Pressure (psig)	Temperature (degF)	Pressure gradient (psig/ft)	Temperature gradient (degF/ft)
2012/03/26 07:49:02	167.65056	Static	9020.00	9020.00	3896.147	245.101		
2012/03/26 08:00:32	167.84222	Static	7000.00	7000.00	3029.547	195.432	0.429	0.025
2012/03/26 08:08:02	167.96722	Static	5000.00	5000.00	2168.082	150.883	0.431	0.022
2012/03/26 08:17:02	168.11722	Static	3000.00	3000.00	1293.556	110.533	0.437	0.02
2012/03/26 08:24:32	168.24222	Static	2000.00	2000.00	854.583	89.285	0.439	0.021
2012/03/26 08:31:32	168.35889	Static	1000.00	1000.00	414.374	74.566	0.44	0.015
2012/03/26 08:37:02	168.45056	Static	0.00	0.00	1.769	62.454	0.413	0.012

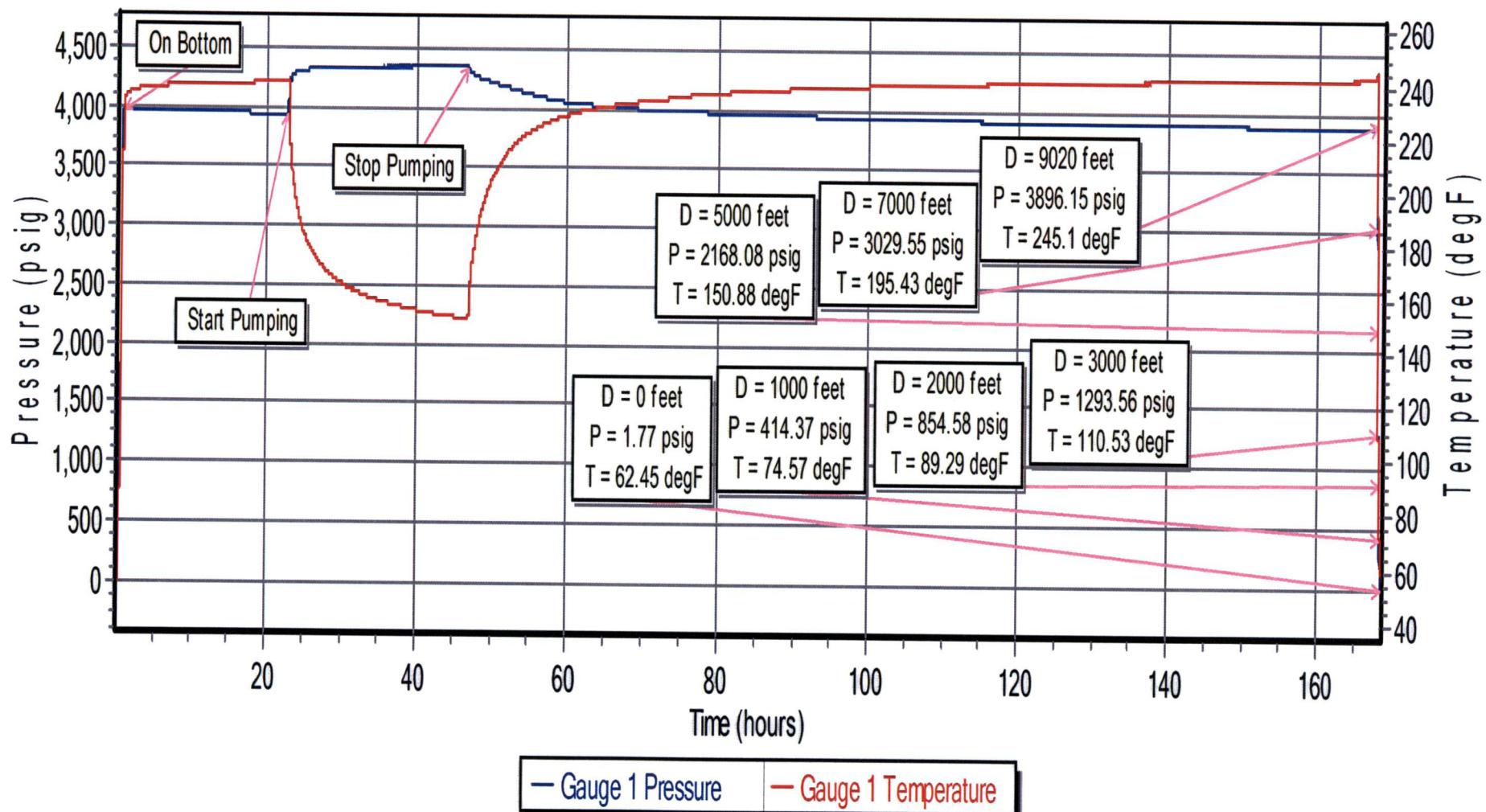
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9020.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Bottom Gauge

DATA PLOT



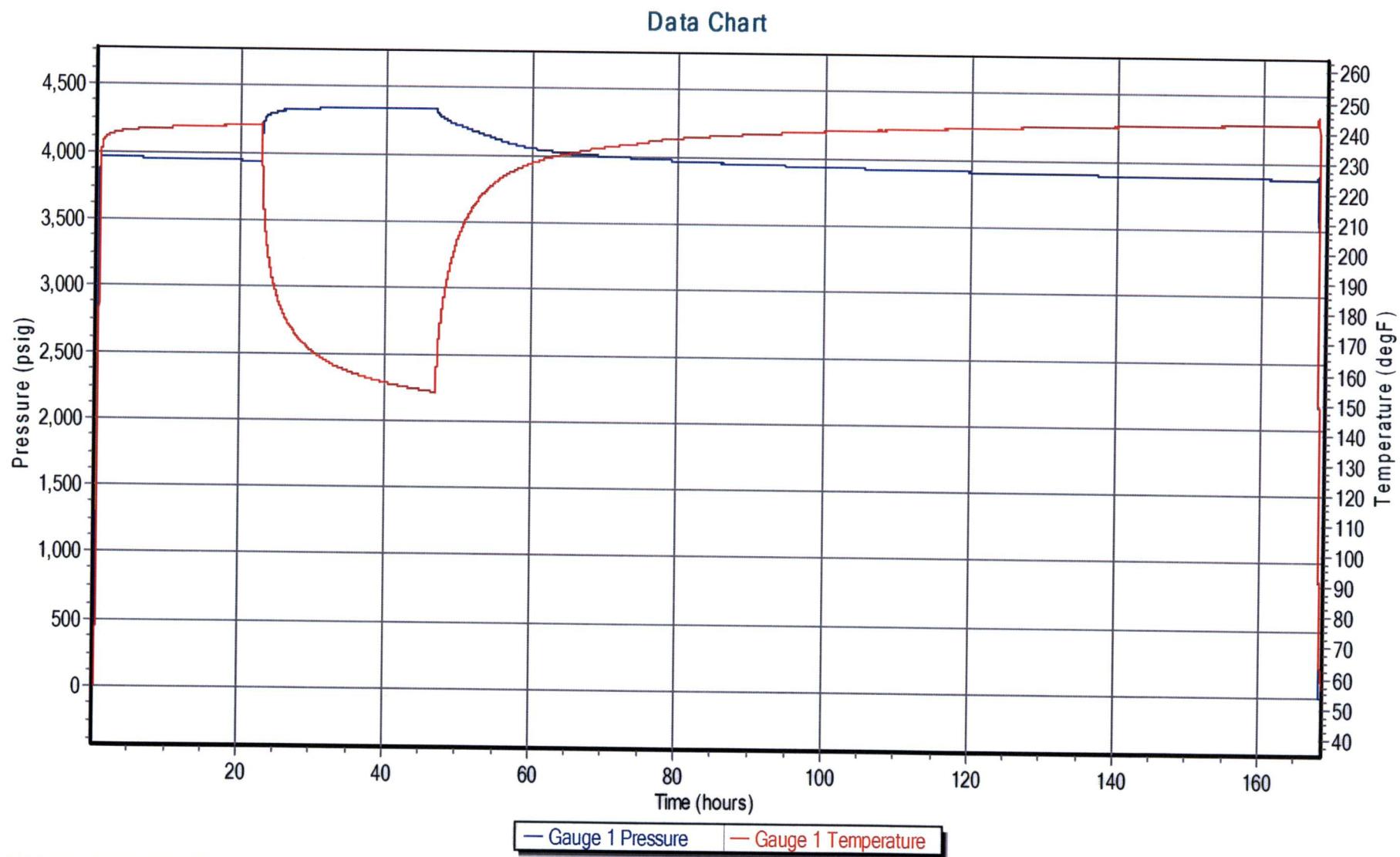
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9020.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Bottom Gauge

SAVED GRAPH #1



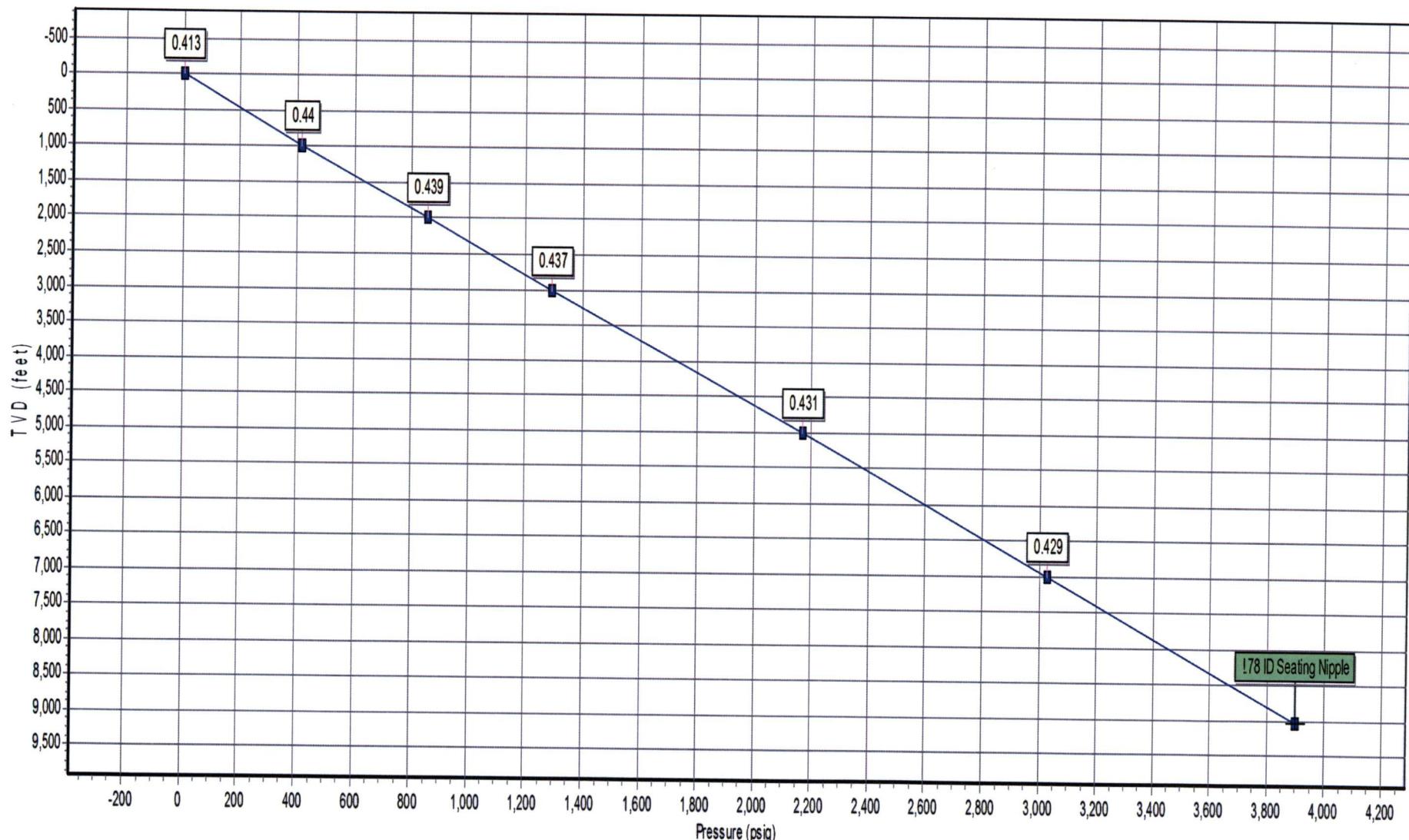
Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9020.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Bottom Gauge

PRESSURE GRADIENT PLOT



Client: Wattenburg Disposal
Test Date: 2012/03/19 - 2012/03/26
Tool Serial #: 4051

Well Name: Suckla Farms Injection Well #1
Location: SENW Sec 10 T1N R67W
Field/Pool: Wattenburg

Formation Name: Lyons
Gauge Run Depth [ft KB (TVD)]: 9020.00000
Test/Prod. Interval Top [ft KB (TVD)]:
Test/Prod. Interval Base [ft KB (TVD)]:

Injection-Static Gradient Bottom Gauge

TEMPERATURE GRADIENT PLOT

